microREPORT # 9

Assessing the Impact of the Kenya BDS and the Horticulture Development Center Projects in the Treefruit Subsector of Kenya

Baseline Research Design

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Action for Enterprise (AFE) is a non-profit organization dedicated to private sector / enterprise development based in Arlington, Virginia.

ACDI/VOCA is a private, non-profit international development organization based in Washington, DC.

Contents

Abbreviations

ACDI/VOCA	Agricultural Cooperative Development International/ Volunteers in Overseas Cooperative Assistance
AFE	Action for Enterprise
AMAP	Accelerated Microenterprise Advancement Project
BDS	Business Development Services
EU	European Union
EUROGAP	European Retail Produce Good Agriculture Practices
FPEAK	Fresh Produce Exporters Association of Kenya
HDC	Horticulture Development Center
HCDA	Horticulture Crops Development Authority
MD	Microenterprise Development Office (USAID)
USAID	United States Agency for International Development

Background and History

1. Background on the tree fruit sub-sector in Kenya

Introduction

To support of its strategic objective of increasing rural household incomes, USAID/Kenya is funding two projects that promote growth in Kenya's tree fruit sub sector and encourage smallholder participation in the tree fruit value chain. The Kenya Business Development Services (BDS) project implemented by Deloitte Touche Tohmatsu Emerging Markets Ltd. and the Horticulture Development Center implemented by Fintrac.

The Kenya BDS project chose export tree fruits – specifically, mangoes, avocados, and passion fruit - as the first of three sub-sectors in which it will promote the development of commercially viable solutions. It based the choice on four criteria:

- Potential for increasing rural household incomes (USAID/Kenya's Strategic Objective Number 7)
- Involvement of a significant number of MSEs in the sub-sector
- Existence of market demand for the goods or services produced
- An opportunity to intervene without duplicating the efforts of other donors (Deloitte 2003b, p.3)

The next step was to analyze the sub-sector and identify constraints to its development. To do so, it carried out a baseline survey (Deloitte 2003a) and a market assessment report for business solutions/services in the sub-sector (Deloitte 2003b). Four principles were to guide the selection of interventions:

- Solutions/services were to be provided wholly or in part by the private sector
- They were to have a high potential for stimulating growth in product markets
- They should strengthen the value chain in the sub-sector
- They should target small enterprises and smallholder farmers.

Kenya BDS then put out tenders to invite proposals for specific interventions that it had identified. To date, twelve awards have been made to finance these interventions.

Meanwhile, Fintrac's Horticulture Development Center project is concerned with the development of the horticultural sector as a whole through three "pillars" of activity and four "themes." The three pillars are:

- EUREGAP/SPS training to help growers of fresh produce stay in the export business
- Development of new crops and products that have more market potential than those currently produced
- Domestic market interventions to ensure that domestic demand for fresh and processed products grows and is supplied, as far as possible, by Kenyan farmers.

The four themes are:

- Marketing services to provide market information, price analysis, and customer contacts to all partners and clients.
- Policy interventions to help lead agencies effect changes in national and international policies that will help improve the business climate for the horticulture sub-sector and smallholders in particular.
- Environmental management to help partners and clients adopt sustainable practices
- Promotion of gender equality by addressing the paucity of women-owned farms and lack of access to training and productivity-enhancing tools and technologies

Although the HDC project deals with a wide range of horticultural crops, only their passion fruit activities are included in our impact assessment. So far, HDC has worked on passion fruit in three provinces (Central, Western, and Rift Valley) and is avoiding areas served by the Kenya BDS project.

The next sections review the setting in which these parts of the Kenya BDS project and the Horticulture Development Center Project are being implemented. They further describe the interventions that are being made through the two projects and their expected impacts on the sub-sector.

Development of the Sub-sector

Kenya lies on the Equator, but temperature, altitude, and annual rainfall differ greatly among regions of the country. The existence of both tropical and temperate climate zones favors cultivation of a wide range of horticultural crops. In the coastal lowlands, the main horticultural crops are mango, citrus fruits, cashews, bananas, hot peppers, brinjals, and melons. In the middle altitudes, they are bananas, mango, avocado, pineapple, grapes, passion fruit, pawpaw, citrus, flowers, onions, garlic, tomatoes, kale, cucumbers, pepper, okra, karella, dudhi, and French beans. At high altitudes, avocado, pears, apples, plums, carrots, cabbages, peas, potatoes, and flowers are cultivated.

In addition to a conductive climate that allows year-round cultivation, other factors cited by the Fresh Produce Exporters Association of Kenya (FPEAK) for the success of horticulture in Kenya are fertile soils and a competitive labor force with good education and technical background.

> "However, the production and marketing difficulties associated with the horticulture industry are substantial. Horticultural products are perishable and delicate, so it is essential to handle them carefully and to minimize the length of time from harvest to their arrival on the shelves in overseas retail outlets. This requires considerable investment in post-harvest facilities and transport infrastructure as well as immediate access to air-cargo capacity. It also requires managerial and marketing skills to link production planning with marketing and distribution. The nature of the horticulture industry has therefore helped Kenyan exporters to develop the necessary technical and managerial skills and has encouraged the development of suitable infrastructure and financing mechanisms, although exporters do still face constraints due to Kenya's domestic transport infrastructure and the cost of access to air freight." (McCulloch and Ota, p. 5)

Horticultural production in Kenya began in the early 20th century (Minot and Ngigi 2003, pp. 3-8) and has recently become one of the few success stories in an otherwise lackluster economy. Over the past two decades, horticulture (comprising fresh fruits and vegetables and cut flowers) grew to be the nation's third most important foreign exchange earner after tourism and tea. Kenya's location in East Africa facilitates exports to Europe and the Middle East, and consignments of fresh cut flowers, fruits, and vegetables are air freighted daily to various destinations from Kenya's two international exports. Some bulky produce is shipped from the Port of Mombassa. The EU is the principal importer of Kenya's fresh produce. The bulk of flower exports go to the Netherlands for sale by auction, while Britain, France, the Netherlands, and Germany are the major importers of vegetables. The leading destinations for fresh fruit exports (mango, avocado, and passion fruit) are France, Dubai, the Netherlands, and the UK. Overall, nearly 90% of Kenyan horticultural exports go to Europe. The Middle Eastern is a significant market for mangoes.

Fruit exports grew rapidly from 1996 to 2001 but remained much smaller in value than either cut flowers or vegetables. The official figures are shown in Table 1.

Table 1: Value of horticulture exports (in millions of Kenya Shillings)

Year	Fruits	Vegetables	Cut Flowers	Total Horticulture
1996	770	2,577	4,366	7,713
1997	805	3,116	4,888	8,809
1998	820	4,052	4,856	9,728
1999	1,256	5,713	7,235	14,204
2000	1,098	5,293	7,166	13,557
2001	1,560	8,035	10,627	20,221

Source: Cited in Dolan and Sullivan

By 1999, Kenya had become the leading supplier of flowers to the EU, followed by Israel, Costa Rica, Colombia, the USA, Ecuador, and Zimbabwe.
Fruit Production: Mangoes are grown primarily along the coast while avocado and passion fruit are cultivated in the highlands. Passion fruit is grown mainly on large farms while avocado and mango are produced almost exclusively by out-growers. According to Jaffee (2003), large-scale commercial growers have not been able to compete with smallholders in these crops because of the latter's lower labor cost and greater motivation to provide careful husbandry.

Commercial farms irrigate horticultural crops, but most smallholders grow fruits and vegetables under rainfed conditions. Only a few benefit from irrigation schemes or small-scale drip irrigation systems. Overall, the Horticultural Crops Development Authority (HCDA) estimates that 40% of exported fruit is produced by smallholders (cited by Minot and Ngigi 2003, pp. 10-11)

Mangoes and avocados both come in local and grafted varieties. Local mangoes grow on old, large trees and ripen together in January-May. To harvest the trees, workers climb up and shake the fruit down. This results in much damage and discoloration. Because of the seasonal glut, growers often get low prices from traders and may let the fruit remain on the trees or rot on the ground. Local mangoes account for about 70% of production (Kirimi 2004). The export market is good but there is a serious shortage of seedlings.

Local varieties of avocados are harvested at different times in different regions of Kenya. They are available year-round but do not keep well. Grafted varieties are grown mainly for export, but they are sometimes diverted to the local market at lower prices.

Passion fruit comes in yellow and purple varieties. Smut and leaf rust pose serious problems for growers (pending the introduction of resistant species) and can only be overcome through a rigorous fungicide regimen, which small farmers often do not understand or find difficult to follow.

Marketing: Muendo, Tschirley, and Weber (2004) point out that although Kenya's export horticulture has received much more attention than the domestic system, small shares of vegetable and production (respectively, 12% and less than 2%) are exported.

Export marketing systems differ by crop. Cut flowers are sent for auction in the Netherlands, but vegetables and fruit are sold on export contracts that specify quantities and prices. Beans and peas are the main vegetables supplied to Europe. British supermarkets took an increasing role in the vegetable trade during the 1990s as a way of ensuring the quantities and qualities that they wanted. This shifted the trade from Kenyan wholesale markets, where Asian traders are active, to contracts with large exporters that obtain their produce primarily from their own farms and large contract farms. The move hurt small out-

growers. Pre-packs for the supermarkets and Asian vegetables became increasingly important products during the 1990s.
Large fruit exporters entered Kenya between 1975 and 1990, offering premium prices for quality fresh produce (Deloitte 2003, p. 7).

> "Export firms such as Vegpro, East African Growers, Kenya Horticultural Exporters entered into contracts with the producers. The exporters directly carried out all product assembly services. Over time this direct linkage between farmers and exporters slowly reduced. Although the farmers received good benefits when working directly with exporters, they did not always honor contractual arrangements, and would break contracts in order to service 'brief case exporters' who exploit spot markets, and are able to offer higher prices for produce. During the early 1990s, brokers and a few independent export agents took over the role of product assembly for the tree fruit sector…Farmers…complain about the inadequacy of brokers who harvest low quality immature fruits and send them into the export market through 'brief case exporters,' thus ruining the market for Kenyan fruits and eroding the avocado farmers' earning power." (Deloitte 2003, p. 7)

Large exporters who wish to source commodities directly from the farmers encourage them to form groups that harvest the fruit and supply the exporter from a central point. This reduces costs for exporters and increases the efficiency of product assembly. Brokers, by contrast, prefer to deal with individual farmers because they can usually get lower prices that way.

The EU is the world's largest importer of horticultural products. In 1999, its imports of fresh fruits reached $5.5 billion while fresh vegetable imports were valued at more than $1 billion and imports of cut flowers at almost $1 billion. However, the European market is highly competitive and increasingly subject to conditions and regulations that impose costs on suppliers. These measures cover matters such as traceability, quarantine, packaging recycling, and human welfare and safety. The EUREGAP (European Retail Produce Good Agriculture Practices) protocol was recently adopted by many European supermarket chains. Under EUREGAP, exporters must certify that products sold were grown and packed under the safest means possible. Certification covers traceability, pesticide management, and labor protection standards. In addition, the EU reportedly plans to introduce microorganism limits. This will require more careful post-harvest handling of fruit.

Tree fruit crops and poverty: According to the 2000 Rural Household Survey, the average Kenyan farm household had 6.8 members and 2.1 hectares of land. The average male head of household had 6 years of schooling, the average female head 4 years. Fewer than half of these households lived within 5 kilometers of a paved road. Almost all farmers (98 percent) grew some fruits and vegetables and 35 percent of fruit and vegetable production was sold in the market. Overall, fruits and vegetables contributed 18 percent of average household income. Over 90

percent of households in all segments of the rural household income distribution grow fruits and vegetables, although richer households market a larger share of their output and account for the bulk of total sales (cited by Minot and Ngigi 2003, pp.17-19). A study by McCulloch and Ota determined that households involved in the production or processing of exported horticultural crops earned higher incomes than households that are not, other things equal. This finding suggests that enabling more households to participate in the sector could reduce poverty substantially in both rural and urban areas.

Horticulture production for export has potential to benefit poor people in several ways: by increasing employment in production, transport, input supply, processing, sorting; by increasing jobs for unskilled workers, especially women; by increasing employment on large farms and plantations; and by building new knowledge and technology that is valuable in producing and marketing other high value products.

Prospects of the sub-sector: According to a sector study contracted by USAID/Nairobi (FKAB Feldt Consulting 2001), Kenya has several competitive advantages in export horticulture:

- A strong and well organized private sector
- A variety of suitable climates for different species
- A rather good main road infrastructure and good local supplies of inputs and implements
- Access to good air cargo handing facilities and airport services with adequate cargo space to major destinations
- Rather simple export documentation procedures
- Incentives for exporters (VAT reimbursement and duty-free imports of most inputs and implements)

The same study identified several important constraints and areas requiring improvement:

- A shortage of irrigation water in many areas
- A general shortage of skilled labor and qualified management staff
- High air freight rates and a need for more cargo capacity to London, Paris, and Frankfurt
- Inadequate communications, power supply, and rural roads
- Failure to exempt contract farmers and out-growers from VAT (because their products are exported through a third party)

The industry has perceived threats to its prosperity from both the Kenyan government and the EU. Recently there was a general fear that the government might raise taxes and fees that impact exporters. The HCDA, founded in 1967, did not take an active part in buying and selling commodities and was not established as a legal monopoly like marketing boards for some other commodities. Instead, it played a more facilitative role (Minot and Ngigi 2003,

p.5). A bill introduced in 2001 threatened to increase government control of the sub-sector by broadening HCDA's powers, but it seems to have been withdrawn following the change in government.

> According to USAID's 2001 sector study:
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> "Some 10-15 major exporting companies dominate the sector. These companies are very well organized, often with an integrated system of production/processing/transport/marketing. There is also a quite well developed small/medium size exporter sector who are well organized on production/transporting level, but less on processing and marketing due to their size of operation. There is a third level of exporters who still perform more or less in an ad hoc manner, and rely on the prevalent market situation and brokers for their existence. However, the latter group has almost disappeared from the flower export sector in the last five years, and will, most probably, decline also in the vegetable sector in the next five years due to the effects of the Code of Practice to be implemented. However, brokers make out an essential part of the fruit export sector and will continue to be important if Kenya is going to remain a fruit exporting country in the future." (FKAB Feldt Consulting 2001, p. 8)

Key Constraints to Horticulture Exports

According to Minot and Ngigi (2003, pp.9-10), Kenya and other horticultural exporters face serious challenges related to changes in the structure of consumer demand in Europe and the transformation of food retailing there:

- *The rise of supermarkets:* The share of fresh fruits and vegetables sold by supermarkets in the UK rose from 33% in 1989 to 70% by 1997. Increasingly, supermarket chains bypass wholesalers and buy directly from exporters in Kenya and other countries. To protect their reputations, the chains impose new restrictions and even organize production in developing countries.

- *Increasing concern over food safety:* European customers are increasingly aware of the health consequences of pesticide residues. In response, FPEAK adopted a Code of Practice for growers in 1999. The Code includes a 14-step documentation procedure for ensuring the traceability of produce handled by the exporter. "This is an important step in establishing a common set of standards regarding safe handling of fresh fruits and vegetables and disseminating the information. However, some aspects of the Code imply significant costs and there are currently no enforcement mechanisms." (Minot and Ngigi 2003, p.10) More recently, EUREGAP has significantly raised the standard that Kenyan produce must meet to enter the European market, as well as the cost of compliance.

- *Competition from other suppliers:* Kenyan horticulture enjoys duty-free access to European markets as a result of the Lome Agreement. When this agreement ends in the next two to three years and Kenya's preferential access to EU markets is terminated, there will be increased competition from countries such as Egypt, South Africa, Chile, Brazil, and Thailand. Even without trade liberalization, horticultural markets are highly competitive and subject to rapid shifts in export competitiveness. Kenya lost the European market for fresh pineapple to Cote d'Ivoire in the 1980s, was squeezed out of avocado exports to Europe by higher quality products from Israel and South Africa, and also lost the market for several temperate vegetables. It responded by finding new markets and expanding exports of French beans, Asian vegetables, and cut flowers. Export competitiveness evolves continuously in response to changes in markets, technology, and competitors (*Ibid.)*

- *Challenges to smallholder participation in export horticulture:* Smallholder share in export horticulture has fallen from 75% in the early 1990s to perhaps 45% today, indicating a "clear decline and rough challenges ahead" (Muendo, Tschirley, and Weber). Since exports have soared, however, this does not necessarily imply an absolute decline in the quantities that smallholders supply to the export market. Production and marketing systems are dualistic: the export sector is competitive internationally, but the traditional system is not even regionally competitive; there are few if any regional exports, largely because of high transportation costs. The *Financial Times* recently reported that:

  > "in the wake of mad cow disease and other scares, European authorities demand ever tighter food quality controls. A bewildering array of these already apply. There are more than a dozen quality standards across the EU, usually set up and monitored by the trade…For poor countries like Kenya, the question is whether the regulations, or non-tariff barriers, are becoming incompatible with the vision of development that sees small-scale crop production of export crops as central to poverty reduction." (Wallis)

As the *Financial Times* article suggests, large producers and exporters find it easier and cheaper to comply with such regulations than do small and medium firms because large firms can spread the cost of compliance, which is substantial, over a larger volume of sales.

Equally challenging constraints exist on the supply side. Among the most critical are shortages of the seedling varieties needed for participation in exports and the lack (on the part of smallholders) of the knowledge, skills, and finance needed to grow fruit in ways that will safeguard quality and protect them from disease.

Key constraints to smallholder participation in the tree fruit value chain

According to an estimate made as part of Deloitte's baseline survey, nearly 200,000 smallholders are involved in the production of mangoes, avocados, and passion fruit in the project areas (Central, Eastern and Coast provinces); some 60,000 (30 percent) of them are female. Only 6,000 or so of these growers (three percent) sell fruit to the commercial market.

Problems facing smallholders participating in the tree fruit value chain include:

- low yields, especially of export quality varieties
- low sales volumes
- low selling price
- low product quality
- high rejection rates
- post-harvest waste
- limited access to business solutions and services. In the Kenya BDS project areas, for example, some 600 individuals/firms provide business solutions and services to producers (extension and training, access to markets, input supply, etc.), but only 38 percent of smallholders accessed these in 2003.

2. The Kenya Business Development Services (BDS) and Fintrac Horticulture Development Center (HDC) Projects

The Deloitte and Fintrac projects seek to develop the competitiveness of the tree fruit sub sector in Kenya and facilitate smallholder participation in the tree fruit value chain by:

- Promoting the production of higher grade, better quality fruit by facilitating access to improved stock and seedlings, productive inputs, and information and knowledge related to tree fruit production through training and extension services. Extension services are provided as embedded services by lead firms, by private extension agents, and by other institutions (e.g., Kari).

- Reducing transaction costs of working with tree fruit smallholders by facilitating direct links between smallholder producers and lead firms involved in high value fruit export and processing

- Facilitating inter-firm cooperation, both horizontally among producers and vertically between input suppliers, producers and buyers, by organizing and building the capacity of tree fruit producer groups, linking smallholder MSEs to lead firms that provide embedded services, and facilitating other business arrangements and relationships.

The overall goals of the Kenya BDS and Fintrac HDC projects are to:

1. Increase small farmer and household incomes

2. Promote growth in final sales in selected sub-sectors
3. Increase outreach and sustainability of solutions/services offered by multiple providers to large number of microenterprise clients
4. Foster a better skilled and more competitive MSE sector

The objectives of the projects are to:

1. Increase productivity in select sub-sectors through market intervention (e.g., commercial development of extension services through independent agents or through embedded services provided by lead firms);
2. Increase market outlets in select sub-sectors though lead firms (e.g, help lead firms go down market – through formation of producer groups; development of embedded extension services to improve capacity of production and quality of products);
3. Improve inter firm cooperation and the organization within the overall sub-sector through the formation of producer groups that can link to buyers more directly to input, service and product markets).
4. Increase access to business services for rural MSEs

Kenya BDS

In May 2003, Kenya BDS issued its first tenders for proposals to carry out interventions to raise income and productivity in the export tree fruit sub-sector by promoting commercially viable solutions to business constraints. The types of business solutions/services promoted include those related to product assembly and grading such as including supply contracts, forward and backward linkages, broker schemes. They also include quality assurance services related to crop husbandry skills such as post-harvest handling, certification, MRLs, and traceability. Kenya BDS facilitates access to commercially viable material inputs (agro-chemicals and seed varieties) as well as the development of commercially viable sources of market information (SMS technology and trading floors), business skill development (training for MSE producers and business service providers), and appropriate technology (to upgrade products and production processes).

The specific activities carried out under the tree fruit related contracts awarded by Kenya BDS to date include: [1]

Input supply	→	Facilitating the provision of inputs Establishing nurseries Establishing a credit facility link between agrochemical distributors and stockists Developing a monitoring system to inform manufacturers and stockists on consumer trends
Extension and training	→	Improving commercial extension services Creating farmer-led extension teams Launching information campaigns Training agrochemical stockists in advisory services and business management Raising farmer awareness on safe use of chemicals
Market access	→	Facilitating market linkages Improving market information through SMS technology and trading floors Establishing collection sites Facilitating improved transportation Facilitating brokerage workshops
Inter firm cooperation	→	Forming and building capacity of producer groups

Fintrac HDC

With regard to passion fruit, the HDC project plans to:

- Develop Kenyan varieties of passion fruit for fresh export.
- Improve agricultural practices of local producers.
- Expand local processing capabilities for local market products.
- Strengthen the farm-to-market value chain, inclusive of business services to small farmers.

By contrast to Kenya BDS, the HDC project does not operate through contracts. Rather, it carries out most project activities directly, through project staff based in Nairobi and agronomists based in four field offices. It works with and through cooperating partners, including KARI, existing smallholder associations, and two small businesses producing plant stock. In the future, it intends to work through

[1] Described in more detail in Annex F

input suppliers as well. This five year project began in late 2003 and is in its first year of operation.

The project decided to focus on passion fruit because it is regarded as a relatively friendly crop for smallholders. Production carries low risk and the market potential is high. Initial project activities related to passion fruit focus primarily on product development by addressing two key constraints to smallholder production: production technology and farmer knowledge. To this end, Fintrac is cooperating with the Kenya Agricultural Research Institute (KARI) on training and plant production, and with various small businesses in Eldoret, including input suppliers and nurseries. Fintrac hopes to establish 30-40 good demonstration plots and, through them, have a ripple effect on passion fruit production throughout Kenya. It is trying to develop and produce fruit varieties that will yield more juice, including the introduction of the jumbo variety from Uganda. It also hopes to find a good investor to build a processing plant that would require input of 50 to 100 tons per week.

Training in EUREPGAP certification also will be an important project activity. They will train producers and companies on requirements for export certification. The goal is certification in 2005. They will train three companies who in turn will train 600 producer groups (with 20 members each).

To summarize, the key activities of Fintrac's work on passion fruit include

Input supply	→	Introducing new varieties of passion fruit Producing plant stock Establishing commercial nurseries
Extension and training	→	Establishing demonstration plots Providing extension services to farmers
Market access	→	Linking smallholder producers to domestic fresh fruit markets Linking smallholder producers to processors of juice concentrate for domestic and export markets Training in EUREGAP certification
Inter firm cooperation	→	Delivering services through farmer groups

3. Purpose of the impact assessment

The purpose of this study is to assess the impact of these projects in:

- improving the competitiveness of the mango, passion fruit, and avocado sub-sectors
- increasing the integration of micro and small enterprises (farmers and others) into value chains
- developing "commercially viable solutions" to constraints facing businesses in the targeted industries
- increasing rural household incomes

4. Key questions

The Kenya BDS and Fintrac projects have taken on a twofold challenge: improving the competitiveness of Kenya tree fruit exports in global markets and increasing the participation of smallholders in the tree fruit value chain. In this context, a key question facing both projects is whether Kenya can stay competitive in global tree fruit markets and, at the same time, maintain a high level of smallholder participation in the tree fruit value chain.

Building on this, it is important for this impact assessment to examine whether project-facilitated interventions have had a positive impact on improving the competitiveness of Kenya's tree fruit sub sector and on integrating smallholders into the value chain. To what extent do project-facilitated interventions contribute to changes in sub-sector competitiveness? To what extent do project facilitated interventions contribute to changes in smallholder integration into product markets, input markets, and service markets in the value chain? Specific questions to address include:

- Can donor support result in developing/increasing commercially viable solutions to problems faced in targeted subsectors and identified business constraints?
- Can donor support to facilitate the provision of commercially viable business solutions in sub-sectors promote the integration of smallholder MSEs[2] into productive value chains? Can they contribute to reduced transaction costs of working with smallholders? Can they contribute to improved inter-firm cooperation, within the chain, vertically and horizontally? Do they help small holders meet export requirements?
- Can the integration of smallholder MSEs into productive value chains lead to enterprise upgrading?[3] Can project facilitated interventions contribute to smallholder production of higher grade, better quality tree fruit?

[2] Smallholder MSEs are small family farms, commonly known as smallholders in Kenya.

[3] Firm upgrading can take four forms: (1) *process upgrading* (transforming inputs into outputs more efficiently by reorganizing the production process or introducing better technology); (2) *product upgrading*

- Can MSE integration into productive value chains contribute to the overall growth of the sub-sector?
- Can donor support to facilitate the provision of commercially viable business solutions in sub-sectors contribute to increased revenues and productivity for participating smallholders? Does this vary between smallholders linked to local and export markets?
- Can donor support to facilitate the provision of commercially viable business solutions in sub-sectors contribute to the improved well-being of participating rural households? Does this vary between smallholders linked to local and export markets?
- Can donor support to facilitate the provision of commercially viable business solutions in sub-sectors contribute to employment creation for poor people in production (as smallholders and as workers on larger farms and plantations), transport, input supply, processing, and marketing? Can it contribute to new knowledge and skills among the poor to produce high value products?
- Can donor support to facilitate the provision of commercially viable business solutions contribute to improved integration of women smallholders and smallholder households headed by women in the tree fruit value chain?

Our research design attempts to address these questions by defining suitable impact variables and measures. These flow from the causal model described in the following section.

5. The causal model

This impact assessment draws on a causal model that delineates paths from project activities to desired impacts. The causal model grounds the impact assessment in an understanding both of the results that the projects are trying to achieve and of the means by which they expect to achieve those results. Our causal model for the Kenya BDS and HDC projects is depicted in Figure 1. In this model, project activities to improve the integration of smallholders into value chains and improve the enabling environment are expected to lead, in the first instance, to commercially viable solutions to constraints in the areas of market access, input supply, and training/extension services. We call these changes project outputs. These changes, in turn, are expected to bring about two "project outcomes," namely increased participation by smallholders in the mango, avocado, and passion fruit value chains and improved competitiveness to meet

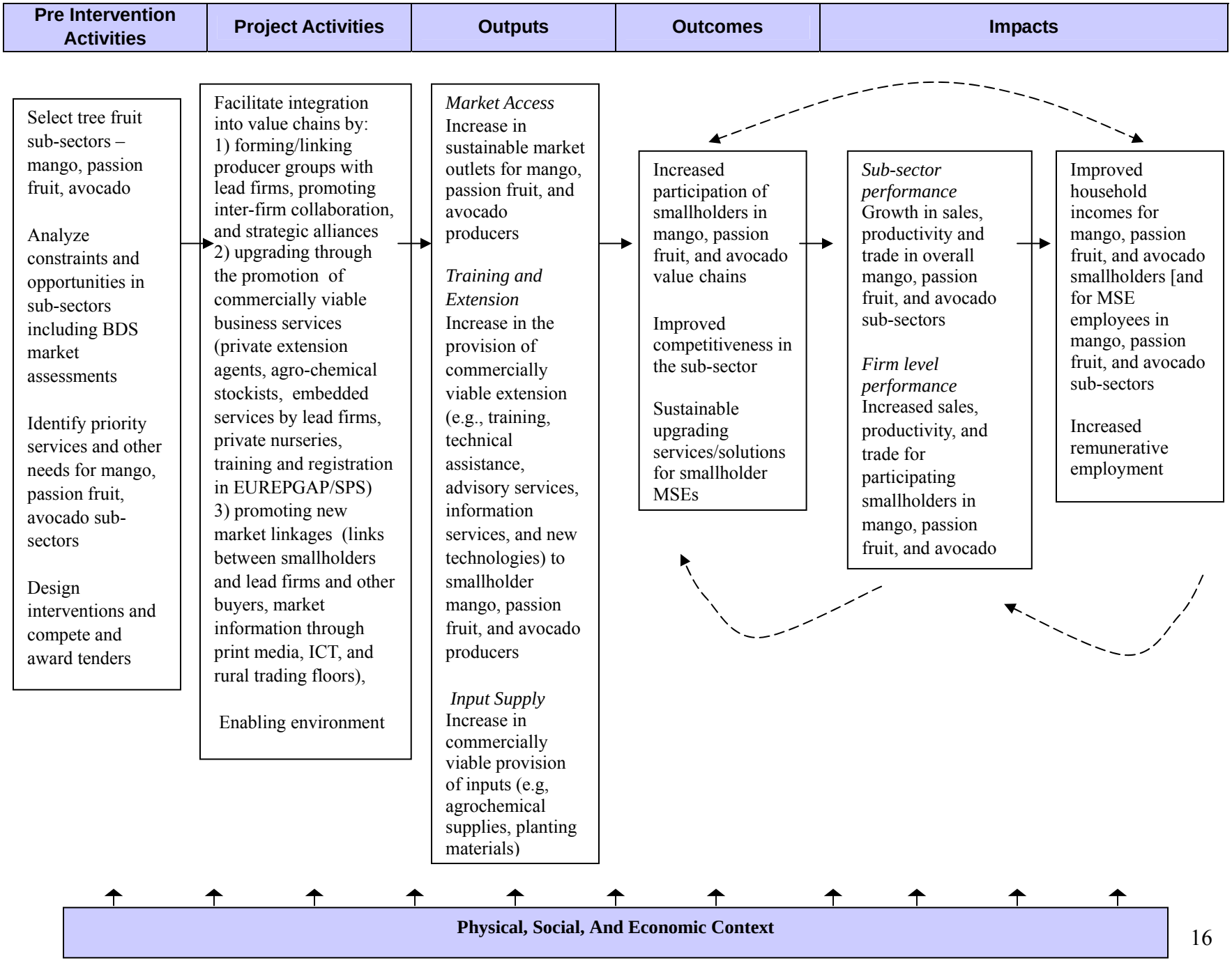
(moving into more sophisticated product lines); (3) *functional upgrading* (acquiring new functions in the value chain to increase the overall skill content of activities); and (4) *inter-sectoral upgrading* (using the knowledge acquired in particular value chain functions to move into different sectors). (Humphrey and Schmitz 2003, p. 4).

the demands of the value chains. These project outcomes, finally, lead to three expected project impacts:

- Improved performance by participating smallholders
- Improved incomes in smallholder households
- Improved performance by the tree fruit sub-sector

The analytical framework for determining whether the expected changes actually occur is outlined in Section 7, below.

FIGURE 1. CAUSAL MODEL FOR KENYA BDS AND FINTRAC HDC PROJECTS



6. Hypotheses

We use this causal model to test a number of hypotheses about the impact of donor interventions in opening up opportunities for smallholder MSEs in local, regional, and global markets and improving the competitiveness of the overall value chain.

General Hypothesis: Project activities can be effective in the development/improvement of commercially viable solutions in the areas of market access, extension services, input supply, and inter firm cooperation that result in increased integration of MSEs into value chains and greater competitiveness of those value chains.

Hypothesis 1: Project activities to promote commercially viable upgrading solutions/services in the tree fruit value chain contribute to greater integration of smallholder MSEs into the value chain.

- Improved/increased market access for smallholder MSEs producers (increased number of smallholder MSEs linked to market outlets)

- Improved/increased input supply
  - Increased use of appropriate inputs (agrochemicals, plant stock, and other supplies); technologies; and finance
  - Use of higher quality inputs

- Improved/increased quality and quantity of extension, advisory, and information services provided by lead firms (embedded) and fee-based providers

- Improved/increased inter firm cooperation/collaboration

Hypothesis 2: Greater integration of smallholder MSEs into the tree fruit value chain contributes to improved enterprise performance and household well-being:

- Increased production in participating enterprises
- Increased revenues in participating enterprises
- Increased employment and employee earnings in participating enterprises
- Increased income in participating smallholder MSE households
- Reduced vulnerability through diversification of income sources in participating smallholder MSE households

Hypotheses 3: Greater integration of smallholder MSEs into productive value chains contributes to improved competitiveness and growth of the targeted value chains.

- Increased production at the sub-sector level
- Increased average productivity
- Increased share of production marketed
- Increased share of production exported

- Improved inter firm cooperation (horizontal and vertical coordination and business arrangements)

7. Framework of analysis

As indicated earlier, we will study impacts at four different levels: participating smallholder MSEs; their associated households; the tree fruit sub-sector; and the provision of commercially viable business solutions. At each of these levels of analysis, we have identified several domains of impact, as shown in Figure 2.

A. Levels of analysis and indicators of change

Participating tree fruit smallholder MSEs

The study will focus on the main intended beneficiaries of the two projects, namely smallholders in Eastern, Central, Coast, Western, and Rift provinces who grow mangoes, avocados, or passion fruit for consumption or sale[4]. The smallholder analysis will compare a sample of smallholders who participate in the Kenya BDS or HDC project with a sample of comparable smallholders who do not participate in either of these projects. With respect to each of the following domains of impact, the hypothesis to be tested is that participation in one of these projects promotes the values being assessed.

Smallholder MSE integration into productive value chains*:* This will involve assessing and comparing changes over time in smallholder MSE participation in the tree fruit value chain.

Integration into the tree fruit value chain will be measured by the volume and percentage of production that is marketed, the average price received for marketed output, and thus sales value. The study will focus on access to and use of market information and sales to different market outlets. Other issues related to smallholder integration into value chains will be explored through qualitative, in-depth interviews with smallholders, for example, whether and how participation in producer groups provides advantages to smallholders; the extent to which access to new market outlets changes smallholder relationships with brokers and the implications of this over time; the nature of smallholder relationships with lead firms or other buyers or suppliers providing embedded services.

The participation of lead firms, brokers, and other buyers in marketing smallholder production will also be examined. We will seek to measure their purchases from smallholders in project

[4] Further details in sample design section.

areas as well as their sales to local and export markets. Finally, provision of embedded business services to smallholders by buyers will be examined.

Enterprise production processes and performance: Changes in *production processes* will reflect changes in *skills*, *knowledge,* and *practices* related tree fruit production and processing (plant husbandry, use of agrochemicals, etc.); *use of market information*; *use of technologies*; and *capital investments* (e.g., tools and equipment). Measures of enterprise *performance* will include production, productivity, employment, and technologies used. *Production* is the total amount of fruit produced in a season. *Productivity* will be measured by quantity produced per hectare or per tree (the more appropriate measure is to be determined) over a season. *Employment* will be measured by the reported person/days of hired labor used for tree fruit production, harvesting, processing or sale over a season. *Technologies used* will be measured by planting stock and inputs used, as well as watering system.

Smallholder MSE households

This part of the impact assessment will focus on the households of smallholder MSEs participating in the projects and households of smallholder MSEs not participating in the projects [5]. It will study impacts on household well being using a combination of variables: changes in household consumption (as a proxy for income), changes in sources of household income ranked by importance (including tree fruit income) and changes in household assets. The use of several variables will allow for triangulation in assessing changes in household well being.

Increased household incomes*: The measurement of household income through the baseline survey is clearly important. After the follow-up survey round, we would like to be in a position to say whether the two projects helped to raise rural household income of project participants. Measurement of household income poses difficult challenges, however. Many well-known problems arise in rural settings in low income countries: the existence of multiple income sources; the importance of income in kind; irregularity in income flows; the paucity or non-existence of record-keeping; limited respondent knowledge and understanding; and sometimes resistance to disclosure, leading to refusal to cooperate or misreporting.*

Consumption is considered by many to be a more reliable measure of household economic status than income in contexts like rural Kenya. It is seen to be less subject to measurement error than income, and a better proxy measure not only of current expenditure but long run wealth. After careful consideration of a number of approaches, the following set of consumption/expenditure indicators will be used as a proxy for household income: consumption in the last 7 days of items grown at home; expenditure on education in the last

[5] To the extent possible, we will also focus on smallholder MSE employees – depending on whether this is a significant group among participating smallholder MSEs – to be determined.

12 months, and other expenditures over the last four weeks including vegetables, meat, packaged food, groceries, cooking fuel, transport, communication, and so on[6]. These indicators will be combined to serve as a proxy for measuring change in household incomes.

Reduced vulnerability*: An important dimension of poverty is vulnerability, which has been defined as the exposure to and the capacity to manage risk. Diversification of income sources is one way poor households manage risk by 'income smoothing', or evening out seasonal fluctuations of income throughout the year. The survey will include a short set of questions about sources of household income and the relative importance of each source of income, including tree fruit income (Annex A). This will allow us to assess diversification, income smoothing, and the role of tree fruit income in this process. Asset accumulation is another way that households manage risk by providing a store of wealth to draw upon in times of need or opportunity. An increase in household assets can indicate reduced vulnerability. The survey also will include a set of questions related to ownership of selected assets relevant to rural Kenya that will be used to construct an asset score. This will include some assets that are likely to be responsive to short term changes in household income. We will use the asset score for two purposes: (1) to assess the impact of project participation and increases in tree fruit income on household assets and (2) as a proxy to determine the relative wealth level of households in the sample. Annex B provides a description of the asset score.*

To complement the survey data on households, the study also will include in-depth case studies of a small number of smallholders to explore the implications of additional tree fruit income for household wellbeing. Issues to be explored through these in-depth interviews may include, for example, the importance of this source of additional income for income smoothing, control and use of tree fruit income within the household, labor allocation related to tree fruit production, and quality of employment issues. The in-depth interviews also will explore decision processes and incentives at the household level related to participation in the tree fruit value chain. How the broader portfolio of household economic activities affects decisions related to expanding tree fruit production, switching form another cash crop to fruit trees, or selling tree fruits to new market outlets will be explored.

Tree fruit sub-sector

The next level of analysis to be addressed is the tree fruit sub-sector, comprising all producers of mangoes, avocados, and passion fruit in Kenya (or, alternatively, based on data availability, in the areas covered by the two projects). This level of analysis covers the same list of topics as was examined earlier for participating smallholders. While the analysis at the earlier level of analysis compared the results achieved by program participants with those achieved by non-participants in the control groups, however, no valid control group can be constructed for the sub-sector level. Although determining attribution will thus be difficult at

[6] These indicators have been used in the Kenya Welfare Monitoring Survey (1999)

this level, developing the sub-sector is an important objective of the two projects and thus cannot be ignored. Some of the growth in production, income, and other impact variables experienced by non-participants within the sub-sector will in fact be attributable to the projects through spillover effects, but this will be difficult to identify and measure.

The sub-sector's production processes will be gauged by total production of the three tree fruits, average productivity, employment, and technologies used.

Integration of MSEs into the value chains will be measured through the value and volume of sales to export and domestic markets. Changing marketing channels for both exports and domestic sales will be examined. To determine what is going on in the marketing process, information will be collected not only from smallholders (to whom do they sell their products, at what price, etc.), but also those who buy from smallholders as well as from buyers and sellers at higher levels of the marketing chain including lead firms. The inquiry will investigate the nature and extent of embedded services as well as commodity transactions.

Provision of Commercially Viable Solutions

The provision and use of commercially viable solutions will be measured in a variety of ways. Improved *market access* will be measured based on increased/improved market linkages between smallholder/MSEs and their buyers. The study will assess the extent to which MSEs currently benefit from market linkages and to what extent those market linkages are increased or improved over the life of the projects.

Improved provision and use of *agricultural inputs* will be measured by total usage of agro-chemical inputs, improved planting stock, and other supplies. Information gathered from smallholders (about their input purchases) will be combined with information gathered from stockists and other sellers of inputs to smallholders. This will include study of the provision of embedded business services to smallholders by input suppliers.

Improved/expanded training and extension, advisory, and information services will be measured through the total amounts of commercially viable services rendered and received. The analysis of training, extension, advisory and information services will focus on the use by smallholders of the services of several types of agents who provide extension on either a freestanding or an embedded basis:

- *Private extension officers (offering extension services related to plant husbandry, application of agrochemicals, organization of producer groups, and business management training)*
- *Farmer-led extensions teams*
- *Lead firms or suppliers providing embedded extension services*
- *Stockists and other input suppliers providing embedded extension/training services*
- *Agrochemical distributors supplying stockists*

- *Nursery operators/seedling suppliers*
- *Financial brokers or financial service providers*
- *Providers of market information*
- *Organizers of producer groups*

The assessment of the provision of commercially viable solutions further will determine: 1) to what extent project promoted services to MSEs are being provided in a commercially viable manner, and; 2) whether these solutions/services will continue once the projects end.

The sustainability of services/solutions[7] will be studied by assessing whether or not commercial relationships are in tact at round two. The study will consider whether someone is providing a commercial a service, whether someone is paying for the service, and whether commercial transactions are taking place.

For each level and domain of impact, we define impact variables and identify possible sources of information in Figure 2.

[7] Sustainability of services/solutions is defined as the ability of the services/solutions to be kept going over time.

Figure 2. Framework for studying impacts

Levels of analysis	***Domains of impact***	***Indicators of change***	***Sources of information***
Treefruit Smallholder MSEs	Increased integration of smallholder MSEs into treefruit value chain	Increased sales/market linkages Increased price received Increased marketing channels used Increased/improved use of agricultural inputs Increased/improved use of extension services	Survey Case studies
	Improved production processes	Skills, knowledge and practices Use of market information Use of technology Capital investment (tools and equipment)	Survey Case studies
	Improved smallholder MSE performance	Increased revenues Increased productivity Increased employment	Survey Case studies
Smallholder MSE Households	Increased incomes	Proxy measure of increased household income (consumption/expenditure) Higher ranking of tree fruit income as source of household income	Survey Case studies
	Reduced vulnerability	Diversification of household income sources Income smoothing Increased assets	Survey Case studies
Markets	Provision of commercially viable solutions to recurrent constraints of MSEs in the value chain	Improved and sustainable market access Improved and sustainable input supply Improved and sustainable extension, advisory, and information services	Survey Secondary market level information Interviews with buyers (brokers and lead firms), input suppliers, extension service providers
	Growth of treefruit subsector	Increased production Increased productivity, Increased employment Increased sales Increased exports Improved inter-firm collaboration	Secondary market level information Interviews with buyers (brokers and lead firms)

B. Comparison groups

In addition to comparing differences between participant and non-participant groups (see sampling section), the study will consider differences in impacts by (1) type and exposure project activities, (2) baseline economic status (asset score) of households, and (3) gender of household head.

Differences in impact by type and exposure to project activities

Given the broad range of project activities and interventions, the type of project and degree of exposure to project activities will be important variables that will affect impacts.

Smallholder participation might involve, for example, joining a producer group (promoted by project to facilitate forward or backward linkages), using an embedded extension service provided by a lead firm participating in project activities, purchasing improved inputs, growing a new variety of tree fruit introduced through project facilitation, or selling to a market outlet identified or promoted by the project. Impacts are likely to vary depending on the nature and extent of this participation. Descriptions of Fintrac and Kenya BDS subproject activities are included in Annex D.

To study the effects of degrees of participation in the project, the survey will include questions about exposure to project activities and use of project promoted services. We will construct a participation index/variable (e.g., low, medium, high) to compare impacts by degree of participation.

The study sample also will be designed to enable comparison of impacts across different types of project interventions. For example, it will allow us to compare the impacts of interventions that focus on input supply, extension and training, market access, or inter firm cooperation.

Differences in impact by baseline economic status of smallholder households

To stratify the sample by economic status we plan to use an *asset score* adapted from a score used by the World Bank in Kenya and other countries as a proxy measure to classify households by wealth status. It is based on a set of yes/no questions related mostly to household assets that will be included in the baseline survey. The baseline will include a broad range of assets including those tested and used in the World Bank work as well as other assets selected on the basis of their potential sensitivity to short term increases in income. The baseline asset scores will be used to stratify smallholder households in the sample into wealth categories. Based on factor tests this list will be reduced to a smaller set of the most relevant assets in round two.

This information will be used for several purposes. First, the baseline scores will be used as a proxy to assess the poverty outreach of the projects. Second, the baseline scores will be used to compare differences in impacts across smallholder MSE households at different starting wealth levels. This should provide some insight on whether households that started out poorer are benefiting relative to other households. Finally, as described above, the asset scores will be used to compare changes in assets between rounds one and two for both participant and non-participant groups as an indicator of impacts on household vulnerability and well being.

Differences in impact by gender of smallholder household head

Women participate in the tree fruit sub sector both as producers/smallholders and as casual and seasonal workers involved in processing and packing in export firms or farm labor. The Kenya BDS baseline survey estimates that 30 percent of MSEs in the treefruit subsector in targeted provinces are headed by women and approximately 3 percent of these producers are linked to the commercial market (Kenya BDS 2003). Other studies have found that a majority of casual and seasonal workers in Nairobi export packhouses are women (McCulloch and Ota). Gender impacts are an important pillar of the Fintrac HDC project, and a majority of participants targeted in several of the Kenya BDS project interventions are women. Moreover, participation of households headed by women in the projects is potentially important for poverty reduction, given higher levels of poverty in these households. This study will assess (1) the extent to which women smallholders participate in the two projects (2) impacts by gender of smallholder and (3) impacts by gender of smallholder household head. While beyond the scope of this study, issues related to impacts on women's employment in export firms, for example, changes in the quality of their employment and remuneration could be explored through complementary qualitative case studies at some point in the future.

8. Research design

Overview

The study will be carried out using mixed methods, including a survey of smallholders, case studies, in-depth interviews, focus group discussions, and a review of secondary information.

A. Survey of smallholders

A survey will be carried out on smallholders in the tree fruit subsector, including project participants and a control group of non-participants.

The smallholder survey will be quasi-experimental in design, with data collected on a sample of participating and non-participating smallholders in the tree fruit sub-sector to compare changes in participating and non-participating smallholders. The survey will be carried out at two points in time (ideally, three years apart) to assess changes in these smallholder enterprises over time.

This quasi-experimental design will allow for a comparison of changes over time in enterprise and household level variables between participating and non- participating smallholders. This difference between participants and non-participants will indicate the impact of the project on variables studied.

Survey sample design

The sample frame for smallholder MSE survey will be based on the following information:

- Total population of smallholders producing mangos, avocados, and passion fruit in Central, Eastern, Coast, Western and Nyanza provinces[8] (estimates of the total population will be based on information from project and previous sub sector studies)

- Total population of smallholders participating in (or targeted by) the Kenya BDS treefruit and Fintrac HDC passion fruit activities by nature and degree of participation (based on project documents and discussions with project staff, and discussion with intervention partners).

From this population, a sample of participating and matched non-participating smallholders will be drawn. Participants will be drawn from lists of participants provided by Kenya BDS and Fintrac. For Kenya BDS, this will include participants in sub-projects that have moved forward in their implementation, but exclude a few sub- projects that have not moved forward for various reasons (to be documented in the baseline report). For Fintrac, given the wide geographic spread of their activities, the sample will include participants that are within a one day range of main towns (El Doret, Thika/Muranga, Bungoma, Kerio Valley). Non-participants will be drawn from separate geographic areas (divisions) that are matched to the geographic areas of participants in terms of agricultural activities, size of small holdings, and crop production. The control cells will be as far away as possible from 'over-spill' of project activities (although it is not possible to completely preclude over spill). Non participants will be matched to participants on a limited set of variables including type of fruit produced, size of landholding, number of trees, gender of farmer, location and, if feasible, a proxy of baseline household poverty level.

[8] More defined geographic areas will be used for the total population--either district, division, location or sub-location data—based on data available from the projects.

To obtain results at a meaningful level of significance, the sample should include at least 1200 smallholder MSEs at the end line (the exact number will be determined upon completion of the analysis plan). Additional information is required on attrition rates to determine number of smallholders to include in the baseline to insure this number at the end line.

The in depth case studies will use a 'snow ball' method, tracing upstream and down stream linkages from smallholders and from lead firms. The qualitative study will include at least six lead firms, four brokers and collectors, 12-16 smallholders, four employees, and ten inputs suppliers[9]. The qualitative sample will include both project participants and non-participants. Space will be reserved for four floating interviews to follow up on issues that may up out in the interviews. The interviews will be recorded, transcribed, and translated for analysis.

Analysis plan for survey

The baseline survey is intended to collect information for the participant and control samples that can be compared with data collected two years later from the same respondents to determine the impact of several tree fruit interventions undertaken by the Kenya BDS and Horticulture Development Center projects. Data analysis at the baseline stage will consist mainly of simple tabulations, frequency distributions, and cross-tabulations. More sophisticated data manipulation will follow the second round of data collection.

Referring back to the causal model shown in Figure 1 (above), the baseline survey will measure the following potential impact variables for samples of participants and controls in the covered interventions:

- Sales, productivity, and trade in mango, passion fruit, and avocado by smallholder MSEs.
- Household incomes for those engaged in mango, passion fruit, and avocado production.
- Paid employment in smallholder MSEs.

Because of anticipated difficulty in obtaining a direct measure of household income, household consumption will be used as its proxy. An estimate of household consumption, including both purchased and own-produced goods and services, will be built up item-by-item.

The baseline survey will provide information about the values of the impact variables in sampled enterprises and households that prevailed early in the projects' implementation histories. Comparison of results for the participant and control samples will also afford an opportunity to analyze potential mediating variables – influences on the impact variables other than program participation. The findings of this analysis will be used to make appropriate

[9] This includes six input suppliers in the IBL project. More emphasis is given to this level of analysis for this sub-project that is focused on the training of agro-chemical stockists, because it is where change is most likely to occur.

allowances for mediating variables when the time comes to measure the programs' impacts through the interventions studied.

The basic tables to be assembled cover three types of information:

- Descriptive information on the respondents (managers of smallholder MSEs that grow the targeted tree fruit for each intervention).
- Information on the smallholder MSEs included in the sample.
- Information on the households associated with the sampled smallholder MSEs.

A detailed analysis plan for the survey has been prepared, describing the tabulations to be performed in each of these categories. Grouped data displayed in tables will be backed up by raw counts that show the full (ungrouped) frequency distribution so that alternative analyses can be performed if indicated.

Following tabulation of the survey data and examination of the pre-defined tables, additional cross-tabulations and correlations will be specified, for example to determine the relationship between personal or household-level variables and enterprise-level impact variables. The database will be organized to make such inquiries easy to perform.

B. Qualitative study of the tree fruit value chain

This smallholder survey will be complemented by qualitative research to improve understanding of (1) the dynamics of smallholder MSE participation in the mango, avocado, and passion fruit value chains; (2) factors that affect the responsiveness of smallholders to changing demand; and (3) how Kenya BDS and Fintrac projects address these issues in the development of solutions/services to integrate smallholders into the tree fruit value chain.

This part of the study will involve in-depth interviews and focus group discussions with approximately 60 tree fruit value chain participants, including smallholder producers, lead firm buyers/ exporters, other buyers (brokers, collectors), input suppliers, nursery operators, and providers of commercially viable extension, advisory, and information services.

The qualitative study will address the questions:

- What are the incentives and risks for smallholders, input suppliers, and exporters associated with upgrading and accessing new/different tree fruit marketing channels? How can solutions/services reduce risks and enhance incentives?

- What is the nature of inter firm cooperation in the value chain -- among smallholder MSEs and between smallholder MSEs, input suppliers, extension agents and buyers? How do issues of trust, power asymmetries, and cultural biases affect inter-firm cooperation? How can solutions/services promote inter firm cooperation in a way that

ensures smallholders are able to contribute to and benefit from increased competitiveness in the tree fruit industry?

The research will focus on:

(1) Factors that influence the *upgrading* of MSEs in response to changing market demand in both the domestic and export markets. Upgrading might involve, for example, supplying better quality and higher grades of fruit; supplying larger volumes of fruit; producing improved varieties or different types of fruit; accessing a new market outlet (by entering into a direct supply contract with a lead firm, selling through a producer group, or otherwise); accessing a new type of input (fertilizer or seed) or service (assembly and grading; training; extension) through embedded arrangements, commercial extension agents, producer groups, or otherwise. Factors such as profitability, risks, transaction costs, and sustainability of solutions and services as they relate to the upgrading of smallholder MSEs will be explored through interviews with smallholders, leaders of producer groups, input suppliers, service providers, and lead firm/exporters.

(2) Factors that enhance or constrain *market access* within the value chain, with a focus on smallholder MSE linkages to buyers (export firms, agents, brokers, and other buyers). We will explore:

Smallholder views on the attributes that characterize each category of buyer.

Risks, transactions costs, and profitability associated with each market outlet.

Lead firm/export views on the attributes that characterize each category of seller

Risks, transaction costs and profitability associated with each seller

Decision processes, issues of trust, cultural biases, and other factors that may affect smallholder linkages to different market outlets.

Smallholder and exporter perspectives on embedded services and how they relate to price, profitability, risk, and transaction costs.

The role of producer groups in linking smallholder producers to these markets.

(3) Issues related to *inter firm cooperation* within the tree fruit value chain. The study will address horizontal linkages among smallholders and ways that cooperation and coordination enable them to benefit from and contribute to the competitiveness of the tree fruit industry. It also will address vertical linkages between smallholders and input suppliers, extension and training providers, and buyers. We will seek examples of cooperation and coordination and how it can contribute to efficiencies, improved

competitiveness, and increased benefits to smallholders in the value chain. Issues such as trust, power asymmetries, cultural biases, and information flows between smallholder MSEs and those they are linked to in the value chain will be explored.

(4) The role of tree fruit income in smallholder *household economic portfolios* (the relative importance of this source of income and who within the household decides how to use it) and how *decision processes and incentives or constraints at the household level* may affect value chain participation and upgrading (e.g., increasing production, adopting a new crop husbandry practice, adding a new crop, switching form one crop to another; selling to a new market outlet; taking on harvesting, assembly, and grading functions, joining a producer group)

Preliminary draft interview guides for the qualitative study are included in the "Qualitative Research Plan" (attached). Analysis matrices will be used to document and organize key findings. The findings will be analyzed and summarized in a report describing the value chain and findings from interviews with smallholders, service providers and buyers. The qualitative research will complement the baseline survey data in addressing the hypotheses and provide a base of information that can be referred to after the second round of data collection in interpreting the quantitative impact findings.

Qualitative work also will include focus group discussions with Kenya BDS and Fintrac field staff at the start of the baseline phase to get their input on outstanding sample definition issues, definition of appropriate variables, and other outstanding questions (e.g., how easy is it for smallholders to recall their tree fruit income? What is the appropriate recall period? What seasonal issues are important to consider?). The questionnaire will be vetted with project field staff at this time for their review and input.

9. Data collection instruments

Primary data collection instruments will include:

- Survey questionnaire including enterprise and household level questions.
- Guide for in-depth interviews with smallholders
- Guide for in-depth interviews with lead firm buyers and exporters
- Guide for in-depth interviews with input suppliers
- Guide for in-depth interviews with service providers (training and extension)

Secondary sources of data to be reviewed will include (preliminary list)

- Economic Survey 2004.

- Statistical Abstract 2003
- National Micro and Small Enterprise Baseline Survey 1999
- HDC statistics on values and volumes of avocado, mango, and passion fruit production and exports
- Studies of horticulture sector in Kenya
- Project documents

10. Work plan

Overall Impact Assessment Work Plan

Activity/Task
Complete research design
Review and refine baseline survey questions and sampling plan with project field staff in Kenya
Complete draft of baseline survey questionnaire
Review and refine baseline survey questionnaire
Input from larger group on baseline survey questionnaire
Finalize baseline survey questionnaire
Translate and pilot test baseline survey questionnaire (English, Swahili, Kikuyu)
Draft in-depth interview questions Draft baseline survey analysis plan (design cross tabs for baseline)
Meet with to discuss pilot test, finalize questionnaire, and finalize qualitative research design
Qualitative fieldwork
Revising Questionnaire based on qualitative phase feedback
Finalize baseline data survey questionnaire and conduct translation and back translation
Code questions, print questionnaires
Conduct pilots for Mango, Avocados, and Passion Fruit
Discuss the pilot findings/feedback; revise questionnaire Recruit and train field workers
Baseline data collection
Data processing
Submission of data tables for review (e.g. frequency counts and cross tabulations)
Analyze baseline survey and qualitative data Draft baseline report
Circulate draft baseline report for comment
Finalize baseline report

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Annex A: Example of method for collecting data on sources and ranking of household income

Importance of income sources (adapted from Tegemeo)

Economic Activity		***Please indicate the order of importance of each of these activities in the household's total income during the past 12 months.*** -9 = Activity could not be ranked 0 = did not give any income though produced 1= this activity gave the highest income of any activity 2 = this activity gave the second highest income … -1 = the household did not engage in this activity ***Enumerator: First place a –1 for all activities that the household did not engage in. Then determine which of the remaining activities was te most important, second, etc.***	***Please indicate the proportion of total household income this income source provided to the household during the last 12 months***[10]
		ORDER	
Production and sales of cereals and tubers	1		
Production and sales of vegetables	2		
Production and sales of tree fruits	3		
Production and sales of other fruits	4		
Livestock production and sales	5		
Farm Kibarua	6		
Non-farm kibarua	7		
Salaried labor	8		
Business activities	9		
Remittance	10		

[10] Melissa: the proportion of each source is needed to calculate the diversification index (the reverse Simpson index)

Annex B: Description of asset score

To assess the outreach of the project by socioeconomic status of the smallholder, to compare wealth effects on project outcomes and impacts, and to assess impact on assets (as one proxy indicator for household well-being) we will construct an index of household socioeconomic status based on indicators of household assets.[11] This index will be used at the baseline to *classify* households by socioeconomic status.

The approach draws on a study conducted by the World Bank, using a set of assets and factor scores derived from a representative country-wide population sample in Kenya. A simple set of yes/no questions on selected assets is asked, and each response is given a weighted score. This adds up to a total household asset score. Based on these scores, households can be classified into wealth quintiles of the population and used to develop a socioeconomic profile of participants and non-participants.

In this project, we will further develop the score so that it is as relevant as possible to rural households in the sample. Moreover, to improve the 'robustness' of the measure so that we may use it to study impacts, we will expand the list of assets to include those that are likely to be sensitive to short term income changes (in other words, include assets that you would expect households to accumulate with increases in tree fruit income). This classification will be used to assess the outreach of the two projects terms of the percentage of participants belonging to each wealth quintile. It will provide an indication of the extent to which the projects reach the poor. Scores will be developed by applying principal component analysis to the data on assets.

Rather than being seen as a proxy for expenditure or income, the asset score has been described as a proxy for something unobserved: a household's long run "wealth" or more broadly, "economic status" (Filmer and Pritchett, 1998). While in many cases it does indicate limitations of current consumption, this is not always the case. Others see the asset score as a reasonable proxy for consumption income and consumption (Gwatkin et al (2000); Pande

[11] The advantages and disadvantages of using assets compared to income and consumption measures in constructing welfare indices is discussed in several studies (Filmer and Pritchett, 1998; Deaton and Grosh; Geda et al 2001; Gwatkin, et al 2000). While use of assets is not a proxy for consumption or income, it is a proxy for something unobserved: a household's long run "wealth" or more broadly, "economic status". It might mean limitations of current consumption, but not necessarily. Previous studies have shown a correspondence between a classification of households based on the asset index and consumption expenditures. The use of an asset index is preferred over consumption expenditures by some because the data is easier to gather and less subject to measurement error. Conventional wisdom is that survey based household consumption expenditures are the best estimate, not only of current expenditures, but are also the best proxy for household's long run wealth. Surveys without consumption expenditures have limited value as they cannot control for or estimate wealth impacts. However, according to some experts, there are no *a priori* arguments as to why current consumption expenditures are a better proxy. There are advantages and disadvantages of each, depending on the purpose of the study and resources available.

"Estimating Wealth Effects without Expenditure Data – or Tears: An application to Educational Enrollments in the Statues of India". Deon Filmer and Lant Pritchett. (World Bank)

and Yazbeck 2003). Some argue that assets are less sensitive to transitory fluctuations; household rankings based on this are more stable (Filmer and Pritchett, 1998).

To illustrate how the asset score works, examples of questions and weights used to create the asset score in a previous study in Kenya are presented below. The factor score used here are based on a national sample survey. We will develop a set of area specific factor scores – by applying principal component analysis to responses received on assets. The resulting factor scores will serve as a basis for ranking individuals by wealth (Gwatkin, Rustein, Johnson, Pande and Wagstaff, May 2000 and Pande and Yazbeck, 2003).[12]

EXAMPLE OF ASSET SCORING APPROACH[13]: Scores based on 1998 Demographic and Health Survey's national sample of households

Question	**Score if response is "yes"**	**Score if response is "no"**	**Item score**
In your dwelling, is there:			
Electricity	1.954	-0.276	
A radio	0.305	-.494	
A television	1.897	-0.247	
A refrigerator	3.435	-0.117	
A bicycle	0.108	-0.036	
A motorcycle	2.703	-0.021	
A car	2.626	-0.114	
A telephone	3.688	-0.086	
A domestic worker not related to household head	2.332	-0.031	
Do members of your household work on their own or the family's agricultural land	-0.494	0.172	
What is the principle household source of drinking water?			
Piped drinking water in residence	1.184	-0.313	
Piped drinking water in public tap	0.083	-0.012	
Inside well drinking water	-0.044	0.004	
Public well	-0.379	0.056	
Rain for drinking water	0.525	-0.007	
River, canal, or surface water for drinking	-0.524	0.313	
Other source of drinking water	0.135	-0.003	
What is the principal type of toilet facility used by members			

[12] *Note: Pande has offered use her of STATA program to carry out principal component analysis on our survey data).*

[13] From: HNP Poverty Thematic Group of the World Bank, "Socio-economic differences in Health, Nutrition, and Population in Kenya". Davidson R. Gwatkin, Shea Rustein, Kiersten Johnson, Rohini Pande, and Adam Wagstaff. May 2000.

of your household?			
Own flush toilet	2.718	-0.165	
Shared flush toilet	1.283	-0.046	
Pit latrine	-0.205	0.046	
VIP latrine	0.575	-0.043	
Bush, field as latrine	-0.695	0.115	
Other types of latrine	-0.079	0.000	
What is the principal type of flooring in your dwelling?			
Dirt, earth	-0.539	1.000	
Wood, plank	0.362	-0.004	
Cement	0.948	-0.453	
Tile flooring	3.206	-0.040	
Other type of flooring	1.264	0.000	
What is the principal roofing material in your house?			
Natural material roofing	-0.755	0.309	
Corrugated iron	0/190	-0.390	
Roofing tiles	3.168	-0.083	
Other roofing	1.498	-0.010	
In your dwelling, how many members are there per sleeping room (score is per member)	{(# members –2.592)/1.893} X –0.259		
Total household asset score (sum of individual item scores)			

Cut off points for Wealth Quintiles

Wealth Quintile	**Asset Index Value**	
	Lowest	**Highest**
Poorest	Lowest	-0.77258
Second	-0.77258	-0.51780
Third	-0.51780	-0.22324
Fourth	-0.22324	0.52588
Richest	0.52588	Highest

Annex C: Participation Variables–Kenya BDS and Fintrac HDC projects

Project activities include:

- Organization of producer groups to facilitate forward and backward linkages
- Facilitating access to improved inputs
- Product development (introduction of new varieties; new technologies)
- Facilitating provision of training/extension services
- Facilitating provision of market information
- Market linkages

Further details on project interventions are included in Annex D. Based on these interventions, the following preliminary list of participation variables has been constructed to identify 'participants' in the study sample. These variables will be vetted/reality tested with project staff on the ground and redefined as necessary.

Smallholders who:
Join project promoted producer groups (that engage in forward or backward linkages with input suppliers, buyers, etc.)
Use embedded services provided by firms who are participating in the project
Use project promoted market information services
Use other project promoted services (extension, training, information)
Buy inputs promoted by the project
Use project promoted market information to link to markets
Sell to market outlets/buyers identified by the project
Grow new varieties of tree fruit or use technologies introduced by the project

Other individuals/firms who:
Participate in various types of technical and management training offered in the context of project interventions or activities
Provide embedded services (and participate in project sponsored capacity building activities to improve their ability to do this)
Join producer groups (supported by the project to engage in forward and backward linkages and to link with service providers)
Access credit promoted through project interventions or activities
Sell to small scale input suppliers (e.g., agrochemical distributors) in the context of project activities

Buyers who:
Receive project support to increase/improve their linkages to, and support of, smallholder MSEs they source from
Buy from producer groups organized as part of project interventions
Participate in project promoted brokerage workshops

Use market information provided through project promoted activities
Purchased a MIP franchise

Annex D: Description of Kenya BDS and Fintrac project activities

KENYA BDS				
Subs-sector	**Type of activity**	**Geographic area Partner**	**Target group**	**Participation variables**
Avocados	Form producer groups to engage in forward and backward linkages Facilitate improved provision of inputs (agrochemicals and seedlings), equipment, and extension services in crop husbandry through embedded service arrangement with lead firm Facilitate the establish of collection sites in collaboration with producers and buyers Facilitate improved transport of goods to Nairobi	Central province *EAGA*	Small holder avocado farmers Lead firm providing contracts to producers and embedded services	**S**mallholders who used embedded service **S**mallholders selling avocados to EAGA **E**AGA
Passion fruit Mangos	Form producer groups to engage in forward and backward linkages Facilitate market linkage to Greenlands Facilitate the establishment of a private passion fruit nursery (including backward linkages with farmers)	Eastern province (Embu and Meru districts) *Just Juice, KARI, KMEPP Greenlands Agrocproducers LTd*	Small holder passion fruit farmers Buyers	*Small holders in producer groups* Small holders selling to market outlets Buyers
Mangos	Form producer groups to engage in forward and backward linkages Link producer groups to existing commercial providers of extension services Facilitate market linkages between producer groups and multiple buyers	Eastern and Central province (Machakos, Makueni, Murang'a districts) *SITE*	Small holder mango producers Buyers Business service providers (Private extension agents)	Smallholders who join producer groups Smallholders who use extension services Smallholders who sell to buyers ID's by SITE

KENYA BDS				
Subs-sector	**Type of activity**	**Geographic area Partner**	**Target group**	**Participation variables**
Mangos	Provide on-farm training of trainers for unemployed extension officers Creation of Farmer Led Extension Teams (made up of lead farmers and extension agents) to provide commercially viable extension services Launch information campaign to increase awareness of value of extension services Establish revolving fund to finance adoption of good agricultural practices	Coast Province (Lamu and Tana River districts) *Coastal Development Authority (CDA)*	Small holder mango producers Business service providers (farmer led extension teams; financial services)	Private extension officers who participate in training Extension agents/lead farmers who join FLET Farmers who access finance through revolving fund
Mangos	Form producer groups to engage in forward and backward linkages Facilitate market linkage to buyers Develop market information data base Facilitate brokerage workshops Train private extension workers mango husbandry and business management Information campaign to sensitize producer groups to value of extension services	Coast province Watamu/Msabaha region, Malindi Kenya Gatsby Trust, KARI, KWETU	Small holder mango producers Extension service providers (private extension agents)	Smallholders who join producer groups Extension workers who participate in training Buyers who participate in brokerage workshops
Mangos	Information campaign to sensitize farmers on nursery development and benefits of nursery seedlings Train nursery operators in mango husbandry and business	Eastern Province Mbeere and Machakos districts *Catholic Dioceses of Embu*	Small holder mango producers Input suppliers (seedling	Nursery operators who participate in training Service providers who participate in

KENYA BDS				
Subs-sector	**Type of activity**	**Geographic area Partner**	**Target group**	**Participation variables**
	management Train extension service providers on grafting, budding, top working		suppliers, extension services)	technical training
Tree fruits (general)	Develop a system for collecting and posting market information on electronic data base Build awareness of availability and use of ICT for market information Train farmers on use of SMS Establish three rural trading floors/market information points	Karatina, Murang'a Embu KACE	Small holder tree fruit producers Buyers Business service providers (market information services)	Small holder who participate in SMS training Small holders who request market information Small holders who made a bid Buyers who use market information Entrepreneurs who purchased a franchise
Tree fruits (general)	Train agrochemical stockists in advisory services related to proper storage, labeling, transport, handling, repacking, and adulteration Train agrochemical stockists in business management Raise awareness of rural farmers on safe application of agrochemicals Establish credit facility link between agrochemical distributors and stockists Develop monitoring system to inform manufacturers and stockists on consumer trends	Eastern and Central province Ideal Business Link, Ltd.	Input suppliers (stockists who can provide technical advice to their MSE clients)	Stockists who participate in training Stockists who access credit facility Agrochemical distributors who sell to stockists

FINTRAC HORTICULTURE DEVELOPMENT CENTER				
Subs-sector	**Type of activity**	**Geographic area Partner**	**Target group**	**Participation variables**
Passion Fruit	Establish 30-40 demonstration plots and offer training in: Grafting techniques Planting techniques Seedling production Pruning techniques Disease management New products (Jumbo passion fruit)	Central, Western, and Rift Provinces KARI	Smallholders and smallholder associations currently or with potential for growing passion fruit Private nurseries	Smallholders attending the training Associations with demonstration plots
Passion fruit	Development of commercial nurseries	Central, Western, and Rift Provinces		Commercial nursery operators Smallholders purchasing products from nurseries
Passion fruit	Search for investor in passion fruit processing plant (to buy up passion fruit produced by smallholders)	Central, Western, and Rift Provinces		

Annex E: Qualitative research plan

Qualitative Research Plan

Assessing the Impact of USAID/Kenya Supported Tree Fruit Project Activities In Kenya

Action for Enterprise

September 20, 2004

Action for Enterprise (AFE) is conducting a study of the Kenya Business Development Services (BDS) and Fintrac projects to assess their impacts on:

- Improving the competitiveness of the mango, passion fruit, and avocado sub-sectors
- Increasing the integration of micro and small enterprises (farmers and others) into these value chains in a way that they contribute to and benefit from the tree fruit industry's increased competitiveness
- Developing "commercially viable solutions" to constraints facing businesses in the targeted industries
- Increasing rural household incomes

The study design is based on a causal model of impact that shows how project facilitation activities to promote commercially viable services/solutions can address constraints to smallholder participation and competitiveness of the value chain. These activities, in turn, leads to sustained access to services/solutions, increased smallholder MSE profits from tree fruit activities, increased rural household incomes, and overall sub sector growth.

The *quantitative* component of the study will involve (1) a longitudinal survey of smallholder MSE tree fruit producers with data collection two years apart and (2) a review of secondary market level information on the production and sale of mangos, passion fruit, and avocados.

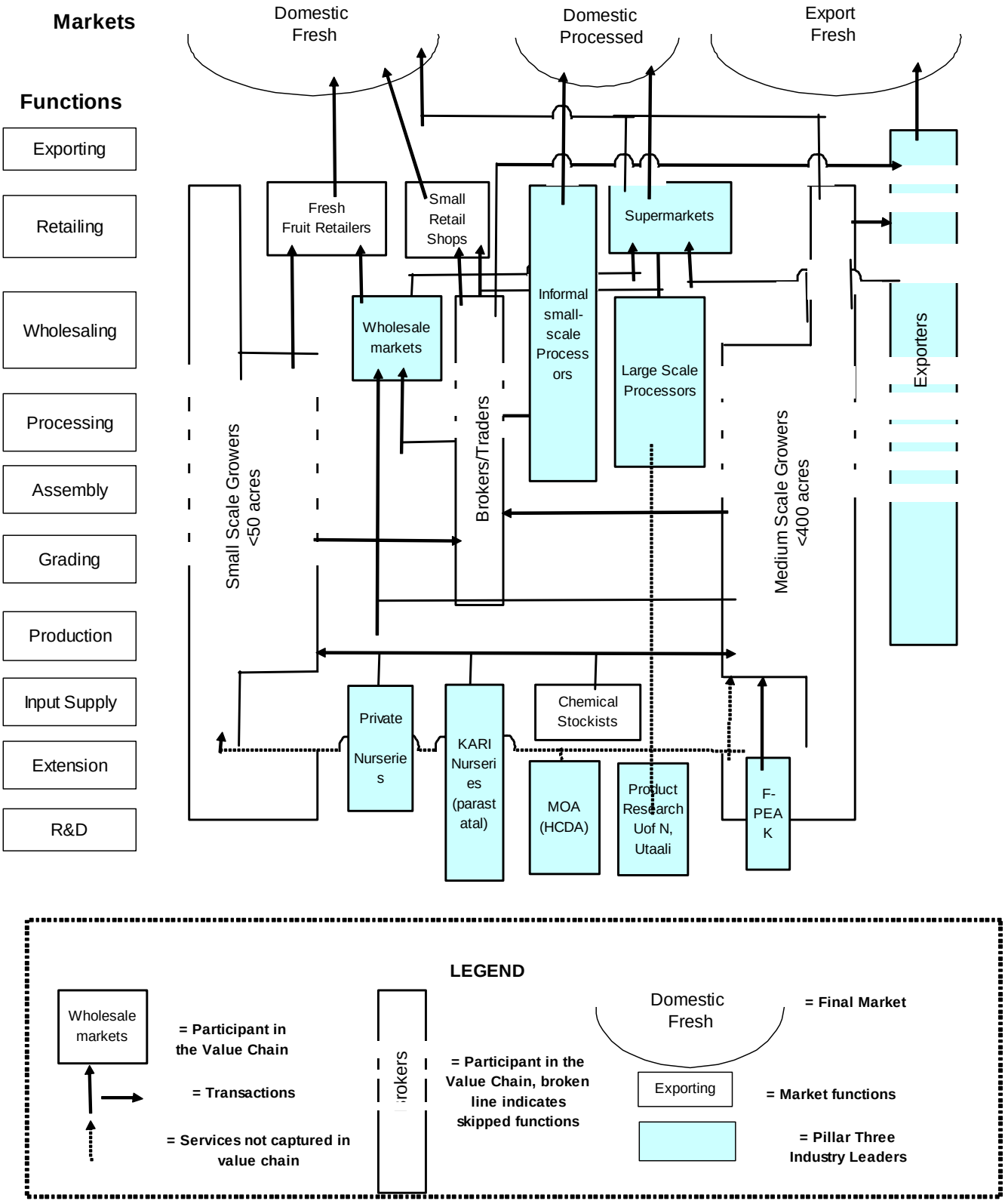
The *qualitative* research will include in-depth interviews with a small sample of value chain actors: smallholder MSEs, input suppliers, service providers, lead firm exporters, other buyers, and producer group leaders. The design of the qualitative research, described below, builds on previous project reports and studies of the tree fruit sector, including Kenya BDS and Fintrac baseline reports, Kenya BDS progress reports, Kenya BDS March 2003 market assessment report, and July 2003 (date?) activity report on upgrading Kenya tree fruit value chains. It also draws on value chain research designs developed under Components A and C of USAID's AMAP/BDS project.

Background

To be competitive in global and domestic markets, actors in the tree fruit value chain need to be responsive to market demands and changes in market demand. Export markets for mangos, avocados and passion fruit are characterized by increasing and unmet demand for higher-grade fresh fruit that meets requirements of established standards and specifications. There also is seen to be potential (unmet) demand for processed products such as juice concentrates and dried fruit. Domestic markets are characterized by growing urban demand for fresh fruit by more sophisticated customers. There also is seen to be unmet domestic demand for processed tree fruit products.

Key actors in the value chain and their relationships are represented in Figure 1, from, *"Activity Status Report Holding hands with folded arms: Upgrading Kenya tree fruit value chains*", Deloitte, Touche, Tohmatsu (no date):

Figure 1. Tree-Fruit Value Chain with Industry leaders (Kenya)



Kenya BDS and Fintrac have identified a wide range of constraints to competitiveness and smallholder participation in the avocado, mango, and passion fruit value chains, including:

Low yields, especially of export quality varieties
Low sales volumes
Low selling price
Inconsistent quality related to crop husbandry practices and lack of quality assurance services
High rejection rates
Post harvest waste
High cost of assembly and grading
Long and inefficient brokering supply chain
Lack of timely delivery
Lack of trust between producers, brokers, and exporters
Lack of enforcement in supply contracts
Limited smallholder access to business solutions and services[14].

Both projects facilitate the development of sustained services/solutions to address these constraints. These services/solutions focus on:

- Building smallholder capacity to deliver quality products in the quantities demanded by the market (by facilitating access to improved stock and seedlings, productive inputs, and information and knowledge related to tree fruit production through training and extension services)

- Increasing the efficiency of the forward linkages between smallholders and larger firms that purchase their product for transformation, processing, or sale.

Through a longitudinal *quantitative* survey, the impact assessment will generate information on smallholder MSEs involved in tree fruit production related to changes in sources of market information, use of capital, labor and material inputs, participation in training, use of extension services, inter firm cooperation, market linkages, productivity, employment and income. At the smallholder MSE household level it will also generate information on changes in household income and well-being.

The *qualitative* research, described below, is intended to generate information to help understand the context of impacts in these areas. It will focus on incentives and risks for smallholders associated with upgrading and accessing new markets. It also will look at incentives and risks for exporters and input suppliers in providing solutions/services to

[14] In the Kenya BDS project areas, for example, some 600 individuals/firms provide business solutions and services to producers (extension and training, access to markets, input supply, etc.), but only 38 percent of smallholders accessed these in 2003.

smallholders and the extent to which the projects are helping them develop/improve these solutions/services. It will consider the nature of cooperation and coordination among actors within the value chain as it relates to smallholder participation and competitiveness. Factors to be explored will include, for example, incentives such as increased profitability or reduced transaction costs; and risks associated with lack of trust, power asymmetries, and cultural biases. Finally, the study will explore how incentives or constraints at the household level may affect smallholder participation in the value chain. This research relates to hypotheses 1, 2, 3, and 5 in the research plan. The aim is to improve understanding of factors that encourage or inhibit the integration of Kenyan smallholder SMEs into the tree fruit value chain in a way that ensures they are able to contribute to and benefit from increased competitiveness in the industry.

Objectives

The *objective* of the qualitative research is to improve understanding of (1) the dynamics of smallholder MSE participation in the mango, avocado, and passion fruit value chains; (2) factors that affect the responsiveness of smallholders to changing demand; and (3) how Kenya BDS and Fintrac projects address these issues in the development of solutions/services to integrate smallholders into the tree fruit value chain.

Key questions

The research will address the following *questions*:

- What are the incentives and risks for smallholders, input suppliers, and exporters associated with upgrading and accessing new/different tree fruit marketing channels? How can solutions/services be improved that reduce risks and provide incentives?

- What is the nature of inter firm cooperation in the value chain -- among smallholder MSEs and between smallholder MSEs, input suppliers, extension agents and buyers? How do issues of trust, power asymmetries, and cultural biases affect inter-firm cooperation? How can solutions/services promote inter firm cooperation in a way that ensure that smallholders are able to contribute to and benefit from increased competitiveness in the tree fruit industry?

Topics

The in-depth interviews and focus groups will focus on the following *topics*:

(5) Factors that influence the *upgrading* of MSEs in response to changing market demand in both the domestic and export markets. Upgrading might involve, for example, supplying better quality and higher grades of fruit; supplying larger volumes of fruit; producing improved varieties or different types of fruit; accessing a new market outlet (by entering into a direct supply contract with a lead firm, selling through a producer group, or otherwise); accessing a new type of input (fertilizer or seed) or service (assembly and grading; training; extension) through embedded arrangements, commercial extension agents, producer groups, or otherwise. Factors such as profitability, risks, transaction costs, and sustainability of solutions and services as they relate to the upgrading of smallholder MSEs will be explored through interviews with smallholders, leaders of producer groups, input suppliers and exporters.

(6) Factors that enhance or constrain *market access* within the value chain, with a focus on smallholder MSE linkages to buyers (export firms, agents, brokers, and other buyers). We will explore:

Smallholder views on the attributes that characterize each category of buyer.

Risks, transactions costs, and profitability associated with each market outlet.

Lead firm/export views on the attributes that characterize each category of seller

Risks, transaction costs and profitability associated with each seller

Decision processes, issues of trust, cultural biases, and other factors that may affect smallholder linkages to different market outlets.

Smallholder and exporter perspectives on embedded services and how they relate to price, profitability, risk, and transaction costs.

The role of producer groups in linking smallholder producers to these markets.

(7) Issues related to *inter firm cooperation* within the tree fruit value chain. The study will address horizontal linkages among smallholders and ways that cooperation and coordination enable them to benefit from and contribute to the competitiveness of the tree fruit industry. It also will address vertical linkages between smallholders and input suppliers, extension and training providers, and buyers. We will seek examples of cooperation and coordination and how it can contribute to efficiencies, improved competitiveness, and increased benefits to smallholders in the value chain. Issues such as trust, power asymmetries, cultural biases, and information flows between smallholder MSEs and those they are linked to in the value chain will be explored.

(8) The role of tree fruit income in smallholder *household economic portfolios* (the relative importance of this source of income and who within the household decides how to use it) and how *decision processes and incentives or constraints at the household level*

may affect value chain participation and upgrading (e.g., increasing production, adopting a new crop husbandry practice, adding a new crop, switching form one crop to another; selling to a new market outlet; taking on harvesting, assembly, and grading functions, joining a producer group)

Sources of information

Qualitative data will be collected through in-depth interviews and focus group discussions with a small sample of actors in the tree fruit value chain. This will include interviews and discussions with smallholder MSE producers, leaders of producer groups, input suppliers, nursery operators, extension workers, lead firm buyers/exporters and collectors and brokers.

Data collection instruments

See attached annexes for questions to guide interviews and focus group discussions.

The sample

A preliminary sample design is presented below. We will liaise closely with Kenya BDS staff and Fintrac to identify study participants who match the criteria and schedule interviews.

Criteria for selecting study participants

The sample will include smallholders, exporters, input suppliers, nursery operators, extension workers and producer group leaders who have participated in facilitated activities. Non-participant buyers (agents/brokers; retailers) will also be included.

- Smallholders in each fruit group who have changed a process, product, or function
- Smallholders who have established a new market linkage
- Smallholders who have not participated in previous interviews
- Leaders of producer groups from each fruit group
- Extension workers who charge for their services
- Commercial nursery operators
- Agents/collectors/brokers not involved in the project
- Buyer who provides an embedded service
- Input suppliers who provides an embedded service

Sample design

	Mango SITE Machakos	**Passion Fruit Fintrac El Doret**	**Avocado EAGA Kandara**	**TOTAL**
Smallholder farmers	1 focus group w/7 farmers 2 individual interviews	1 focus group w/7 farmers 2 individual interviews	1 focus group w/7 farmers 2 individual interviews	*21 in focus groups* *6 individual interviews*
Input suppliers/ Stockists	2 Ideal Business Link (IBL) 2 others (?)			*4*
Private nursery operators		2 (Fintrac/ Central)		*2*
Extension workers	2 commercial extension services	1 Fintrac ext. agent	1 EAGA service provider	*4*
Lead firm buyers/exporters	2	2 (Just Juice)	2 (EAGA)	*6 (TBD by David and Steve)*
Agents/ collectors/brokers	1 Machakos	1 El Doret	1 Thika	*3*
Fresh fruit retailer (domestic market)	1 up-market Nairobi retailer 1 ordinary kiosk seller			*2*
Leaders of producer groups	2	2	2	*6*

Machakos – SITE Mangos

1 FGD
2 individual interviews with farmers
1 IBL input supplier (Machakos)
2 private extension workers
1 broker
2 producer group leaders

<u>Kandara – EAGA Avocados</u>

1 FGD
2 individual interviews with farmers
1 IBL input supplier (Thika)

1 service provider linked to EAGA
1 broker (Thika/NBI)
2 producer group leaders

El Doret – Fintrac Passion Fruit

1 FGD
2 Farmers
2 input suppliers
1 extension worker
1 broker
2 producer group leaders

Nairobi

1 FGD lead firms
2 retailers

Organization of the research

Melissa Baker, Jennefer Sebstad, and other members of the RI research team will carry out the qualitative fieldwork in October 2004. The team will draft preliminary findings in bullet points immediately following the fieldwork. RI will type up the field notes and transcripts by the end of October. The team will analyze the results and complete a summary report on the qualitative research findings by the end of November.

Schedule for data collection

Day 1 [Nairobi]

- Field team meets to review objectives and organization of the research
- Meet with Kenya BDS and Fintrac staff to review objectives of the research and to discuss criteria for selecting participants and questions that will guide the interviews.
- Review and finalize the interview guides
- Review and finalize interview and focus group schedule and appointments

Days 2-4 [Kandara, Machakos, El Doret][15]

- Individual interviews with smallholder MSE producers (6 individual interviews)
- Focus group discussions with smallholder MSE producers (3 focus group discussions)
- Interviews with 6 producer group leaders
- Interviews with 2 nursery operators
- Interviews with 4 extension agents

[15] Baker and Sebstad will work with field teams for one day in each of the three field sites. The field teams will stay in the field as required to complete interviews in each of the sites.

- Interviews with 4 input suppliers
- Interviews with 3 local agents/collectors/brokers

Day 5 [Nairobi]

- Interviews with 6 lead firm/exporters [TBD]
- Interviews with 2 domestic fresh fruit retailers

Day 6, 7 [Nairobi]

- Field team meets to review results, agree on preliminary findings, and draft bullet points to share with stakeholders
- Field team draws up detailed outline of report

Schedule for analysis and write up

- Type up notes/transcripts from field interviews [October 29]
- Complete analysis of data and draft report [November 24]
- Circulate report for review
- Finalize report [November 30]

Expected Outputs

The qualitative findings will be summarized in a report describing the objectives of the research, the methodology used, key findings, and conclusions. Annexes will include interview guides, interview lists, and relevant analysis tables/matrices. The findings will complement the baseline survey data in addressing the research hypotheses and provide a base of information that can be referred to after the second round of data collection in interpreting the quantitative impact findings.

Attachment A: PRELIMINARY DRAFT INTERVIEW GUIDES

A1: QUESTIONS TO GUIDE INTERVIEWS AND FOCUS GROUP DISCUSSIONS WITH SMALLHOLDER PRODUCERS [preliminary]

Objective: To improve understanding of incentives and risks that affect the responsiveness of smallholder MSEs to changing market demand in the tree fruit value chain.

1) Introductions and discussion of the purpose of the in-depth research

Background information

2) Describe the type of tree fruit grown (mango, avocado, passion fruit) that you produce
3) How much did you harvest last season (date)? How much did you sell last season (dates)?
4) Approximately how much in total did you earn?

Market linkages

5) Who do you sell to?
6) What are the ways that producers can sell their products?
7) Describe features that distinguish these different buyers/marketing channels?
8) How do these marketing channels differ in terms of
   a) profitability,
   b) risk (chance they will suffer a loss),
   c) marketing or transaction costs (the time it takes to gather information about the market alternative, travel to the place of sale, time spent meeting with the buyers, time it takes to collect payment, etc.),
   d) nature of their relationship with the buyer (i.e., do they have a close relationship; do they have repeat transactions; do they receive any of the following from the buyer: inputs, extension services, information, training, credit, etc.), and
   e) level of trust that producers have in this type of buyer.

9) How does selling to exporters affect access to other market outlets? (examples)

Upgrading (Improvements to business practices made either alone or with support from others)

10) Please describe any changes you have made in the past year [or appropriate reference period] in the production or sale of tree fruits.

    a) Change in type or variety of fruit
    b) Change in crop husbandry practices
    c) Change in how harvested
    d) Change in how much harvested
    e) Change in post-harvesting activity
    f) Used an embedded service or another commercial service? If so,
       Did you pay anyone to help you make these changes?
       Did you receive support from your buyer(s) and/or input supplier(s) to make these changes?
       Did you receive support from government, development projects, NGOs, etc to make these changes?

g) Used a new input
h) Sold to a new buyer

11) Please describe the main reasons motivating you to make these changes (incentives, why you made the change)

12) Describe how it worked out. Describe ways, if any, you have benefited from these changes.

13) Please describe disadvantages or risks you faced in making these changes (the potential or real losses associated with the change)

14) Please describe the disadvantages or risks of NOT making changes

Inter firm cooperation/coordination - horizontal

Objective: to explore how trust, power asymmetries, and cultural biases may affect horizontal cooperation through examples of how tree fruit producers coordinate with each other and what motivates them to do so.

Nature of cooperation

15) Do you sell to the same tree fruit buyers as your neighbors who sell tree fruits? (if so, which buyers)
16) Do you discuss tree fruit selling prices?
17) Do you discuss when to pick and sell the fruit?
18) Do you share transport of tree fruit to selling points with your neighbors?
19) Do you share labor related to tree fruit with your neighbors (for harvesting or otherwise)
20) Do you share information about crop husbandry with your neighbors?
21) Do you participate in the farmer groups? If so, are you in the same groups as your neighbors?

Role of producer groups:

22) Are you a member of a tree fruit producer group? Who initiated the formation of this group?
If so, describe the role of the producer group. What economic activities does it engage in (joint procurement of inputs, joint collection/transportation/sale of production, advocacy, joint access to finance, etc.)?

23) How is this group different from other farmer or women's groups?
24) Describe similarities and differences among members of the group
25) How much time do you spend attending meetings?
26) How do you travel to the meeting place and how long does it take you?
27) How would you describe the differences between members and non-members? How do you feel about communication in the group? (transparency and flows of information)?
28) Can you give an example of how decisions are made within the group (re: selling prices; payment system)
29) Can you give an example of how disputes are resolved within the group?
30) Does the group deal (as a common entity) directly with buyers, input suppliers, financial institutions, and/or government? Do leaders negotiate contracts and make agreements directly on behalf of the group? If not, why not? If so, how do you know you can you trust your leaders?
31) Describe any problems the group has had.
32) Describe the main benefits of being a member of this group.

Inter firm cooperation- vertical

Objective: to explore how trust, power asymmetries, and cultural biases may affect cooperation between producers, buyers, input suppliers, and service providers through examples of how they cooperate with each other and what motivates them to do so.

Embedded services

33) Describe the different kinds of support or assistance (services) you receive from [your buyer or input supplier] Ask separately about buyer(s) and supplier(s). Ask specifically about: inputs, finance, training/technical assistance, introduction of new/improved products, group organization support, access to markets/market information, tools/equipment.
34) Could you get this kind of support/assistance from someone other than your buyer or input supplier?
35) How does this kind of support benefit you? (probe how risks, transaction cost, profitability)
36) How does it benefit those who provide it to you? (probe risks, transaction costs, profitability)
37) Has this kinds of support helped you to earn more from tree fruits? Explain why or why not.
38) Are you confident that this kind of support will be available in the future? (sustainability)
39) Are you confident that the buyer you contract with (and who provides you various kinds of support) will uphold agreements to buy the fruit you harvest? [Explain why or why not] (trust)

Negotiating power (power asymmetries, cultural biases, information flows)

40) Describe how terms or agreements with [different types of] buyers are negotiated (either individual agreements you have or agreements made through a producer group).
41) How do these agreements affect your flexibility to sell tree fruits through other outlets -- to agents, brokers, wholesalers or retailers?
42) Describe how disputes, if any, with buyers are handled.
43) Give other examples of how you have cooperated (recently or in the past) with a buyer or input supplier (tree fruit or other horticulture crop)
44) Give examples of 'missed opportunities' for cooperation
45) Give examples of any problems you have experienced due to lack of cooperation with buyers, input suppliers, or service providers.

Household decision processes

46) How important is tree fruit income as a source of cash income for the household?
i) More than half
ii) Less than half but significant
iii) Not significant

47) Who in the household gets paid? Who keeps the income? (give examples)
48) How is the income used? Who decides how to use the income? (give examples)
49) Do you ever discuss with other members of the household the following:
    a) how much to harvest?
    b) who will work in this activity?
    c) who to sell to?
    d) what price to charge?
    e) If so, who do you discuss this with? Do you ever disagree? If so, give an example of the disagreement and the outcome.

50) Please describe who works on tree fruit activities by gender (parents, children, neighbors, hired labor).
    a) What do they do?
        i) Crop husbandry
        ii) Harvesting
        iii) Post harvest activities
        iv) Marketing

    b) Approximately what portion of all labor inputs do they contribute?
        i) All
        ii) More than half
        iii) Less than half but significant
        iv) Insignificant

A2: QUESTIONS TO GUIDE INTERVIEWS WITH PRODUCER GROUP LEADERS [preliminary]

Objective: to better understand the role of producer groups in linking smallholder producers to the tree fruit value chain in a way that they benefit from and contribute to competitiveness

1) Introduction

2) What is the size of the producer group? When was it formed? Who initiated the creation of the group? Are all members tree fruit producers?

3) What are the functions of this producer group? (joint procurement of inputs, joint collection/transportation/sale of production, advocacy, joint access to finance, etc.)?

What are concrete examples*of how members have benefited from the group for:

- accessing inputs (versus getting them on the retail market)
- selling as a group or bringing to a common collection point (versus selling to private buyers individually)
- accessing finance (versus going to a financial institution)
- etc.

4) [these questions should be looked at according to specific economic activities that the group conducts] How does this producer group cover their expenses? What are your sources of income? Does the producer group have full-time staff and management?

5) Role of producer group in promoting upgrading (process upgrading, product upgrading, functional upgrading, inter-sectoral upgrading) Are there examples of the producer group helping MSE members to:
   - improve productivity
   - improve product quality
   - adopt new products
   - find alternative buyers
   - take on new functions in the value chain

6) Role of producer groups in addressing constraints in tree fruit value chain
   i) Low yields, especially of export quality varieties
   ii) Low sales volumes
   iii) Low selling price
   iv) Inconsistent quality related to crop husbandry practices and lack of quality assurance services
   v) High rejection rates
   vi) Post harvest waste
   vii) High cost of assembly and grading
   viii) Long and inefficient brokering supply chain
   ix) Lack of timely delivery
   x) Lack of trust between producers, brokers, and exporters
   xi) Lack of information flows from exporters to producers
   xii) Lack of enforcement in supply contracts
   xiii) Limited smallholder access to business solutions and services[16].

[16] In the Kenya BDS project areas, for example, some 600 individuals/firms provide business solutions and services to producers (extension and training, access to markets, input supply, etc.), but only 38 percent of smallholders accessed these in 2003.

7) Incentives for smallholders to join groups (provide examples)

8) Risks for smallholders in joining groups (provide examples)

9) Views on why earlier smallholder schemes have failed

Interfirm cooperation/collaboration

10) Role of producer groups in promoting collaboration and cooperation among smallholders

11) Role of producer groups in promoting collaboration and cooperation between smallholders and input suppliers, exporters, and other buyers

Leadership roles

12) Role of leadership in building trust;

13) Role of leadership in creating efficiencies – trust and autonomy in negotiating contracts and terms of contracts on behalf of members

14) Leadership challenges

A3: QUESTIONS TO GUIDE INTERVIEWS WITH AVOCADO, MANGO AND PASSION FRUIT EXPORTERS

***Objectives**: to improve understanding of incentives and risks of sourcing from smallholders compared to other suppliers and how market linkages between smallholders and exporters can be strengthened/improved*

Demand

1. What types of avocados/mangos/passion fruit do you sell?
2. Where are your main markets?
3. How would you characterize these different markets in terms of demand?
4. What do you see as the competitive advantage of Kenyan tree fruits in export markets (price, quality, volumes, timeliness/seasonality, flexibility)?
5. What do you see as the trend in terms of changes in demand for tree fruits?
6. In the context of these changes, how can Kenyan tree fruits remain competitive in the future?

Supply

7. Who do you buy tree fruit from? (supplied by own plantations; brokers; producer groups; individual farmers; other)?
8. What are your experiences in sourcing from smallholder? What are the advantages / disadvantages of sourcing from these different kinds of suppliers? (price, volume, quality, variety, timeliness of delivery, flexibility).
9. How do the different kind of suppliers compare in terms of your:
   - profitability
   - risk (chance you will suffer a loss),
   - ***marketing or transaction costs (the time it takes you to gather information alternative suppliers, travel to the place of sale, time spent meeting with the suppliers, time it takes to negotiate with suppliers, time it takes to make payments, etc.),***
   - relationship with them (i.e., do you have a close relationship; do you have repeat transactions; do you provide any of the following to the seller: inputs, extension services, information, training, credit, etc)
   - level of trust that *you* have in this type of seller; that *producers* have in this type of seller

Direct purchases from smallholders

10. How important are smallholders as a supplier of [avocados, mangos, passion fruit]?
11. Do you offer any of the following forms of support/assistance to your smallholder suppliers:
    - Provide or facilitate access to inputs
    - Provide or facilitate access to technical assistance in crop husbandry
    - Provide or facilitate access to finance
    - Introduce new crops
    - Provide information on quality specifications required by international market
    - Provide or facilitate access to tools or equipment
    - Assistance in forming producer groups
    - Guaranteed purchases
12. If you provide one or more of the above, what is your incentive/motivation for doing so?
13. What risks do you face in providing the support/assistance (embedded services/solutions) described above?
14. Are you interested in increasing this kind of support/assistance? If so, what keeps you from doing so?

A4: QUESTIONS TO GUIDE INTERVIEWS WITH INPUT SUPPLIERS

Objectives: to explore the nature of linkages between input suppliers and smallholders, including a focus on the provision of embedded services by chemical stockists; their role in providing upgrading services/solutions to smallholders in the value chain; their potential for supplying inputs on a sustainable basis.

Introductions

What do you sellWhat other services do you provide?

Who do you sell input supplies to? (households, small producers, large farmers, producer groups, government, NGOs, etc.)

Do you provide any of the following support/services to your clients:

- information (on the use of your products)
- technical assistance or demonstration (on the use of your products)
- growing guides
- credit for purchases
- organization of groups
- links to buyers or other suppliers
- smaller packaging for small holders
- etc.

If you provide one or more of the above, what is your incentive/motivation for doing so?
Are you interested in increasing this kind of support/assistance? If so, what keeps you from doing so?

How long have you been in this business?

What percent of your customers are smallholders? What percent of your sales are to smallholders?

In looking to the future, where do you see potential for increasing profits?

What initiatives have you undertaken with the project (Kenya BDS or Hort) to improve the supply of inputs to small holder farmers? Will these lead to sustainable solutions to the recurrent needs of MSE producers?

A5: QUESTIONS TO GUIDE INTERVIEWS WITH NURSERIES, EXTENSION WORKERS, AND OTHER SERVICE PROVIDERS [preliminary]

Objectives: to explore the nature of linkages between nurseries, extension workers, and other service providers and smallholders; their role in providing upgrading services/solutions to smallholders; their potential for supplying services on a sustainable basis.

Introductions

What kind of extension services do you provide?

Who do you provide your extension services to? (small scale farmers, large scale farmers, exporters (who hire them to train contract producers), producer groups, etc.)

How much do you charge for your services?

Which type of client is the most profitable for you?

How long have you been providing these services?

How would you describe the features that distinguish your different customers?

What percent of your customers are smallholders? What percent of your extension services are with smallholders?

What is the nature of your relationship with customers? (i.e., do you have a close relationship; do you have repeat transactions)

What could be done to increase the amount of private (commercially viable) extension to small holder producers?

What initiatives have you undertaken with the project (Kenya BDS or Hort) to improve/increase the provision of private extension services small holder farmers? Will these lead to sustainable solutions to the recurrent needs of MSE producers?

Attachment B: Outline for Summary Report on Findings From Qualitative Research (preliminary draft)

1. Background

Document the structure of the avocado, mango, and passion fruit value chains, highlighting the role of smallholder MSE producers.

- Review value chain map (map done by Kula et al, July 2004 attached)
- Elaborate smallholder MSE participation in each value chain
- Update any current context issues affecting growth of value chain and the projects
- *[Refer to Kula et al. 2003; market research findings on key constraints/critical success factors]*

Discuss key upgrading and governance issues in the tree fruit value chain as they relate to key actors.

- Upgrading issues
  - Process
  - Product
  - Functional
  - Inter-sectoral
- Governance issues
  - Inter firm collaboration/cooperation
  - Power asymmetries
  - Information asymmetries
- Key actors
  - Smallholder MSE producers
  - Input suppliers
  - Extension/training/other service providers
  - Buyers, including brokers, collectors, lead firms, other buyers

Discuss the role of the Kenya BDS and Fintrac supported interventions in addressing key upgrading and governance issues through

- Improved input supplies
- Commercially viable business services (private extension agents, agro-chemical stockists, embedded services by lead firms, private nurseries, training and registration in EUREPGAP/SPS) improved vertical and horizontal inter firm collaboration through organization of producer groups and other strategic alliances
- Improved markets linkages by linking producers with lead firms and other buyers (through producer groups and otherwise)
- Improved vertical and horizontal inter firm collaboration.

2. Objectives of the research

3. Methodology used

4. Key findings

5. Conclusions

<u>Annexes</u>

Interview guides

Interview lists

Relevant analysis tables/matrices

Market linkages	Profitability	Risk (chance of a loss)	Transaction costs	Nature of relationship	Illustrative Examples
Links between smallholders and buyers					
Links between smallholders and input suppliers					
Links between smallholders and service providers					

Upgrading	Profitability	Risk (chance of a loss)	Transaction costs	Nature of relationship	Trust
Process upgrading					
Product upgrading					
Functional upgrading					
Inter-sectoral upgrading					

Inter firm cooperation	Nature of cooperation	How it affects profitability	How it affects transaction costs	How it affects risks
Horizontal linkages				
Vertical linkages				

Annex F: Smallholder Survey Sample Frame Summary

	Current number of farmers	*Estimates of any new farmers to be there at time of survey*	*Total farmers*	*Proposed test*	*Proposed Control*
East Africa Growers – *Avocado* Central	395	168[17]	563	300	300
CDA *Mango* [18] **Coast**	750		750	300	300
SITE *Mango* Eastern Makueni, Maragua, Muranga, Machakos	1257		1257	350	350
IBL *Mango* Spread out over **Central, Eastern** Embu/Meru Machakos	300[19]		300	200	0
KADI *Mango* Eastern Mbeere	142		142	70	70
JUST JUICE *Passion* Central	619		619	300	300
FINTRAC *Passion* Western	1587		1587	410	410
			5218	1930	1730

[17] Assumes 6 groups of 28 in Ithiru
[18] We don't know how many farmers but there are 50 extension workers and I am assuming they each have15 farmers
[19] Number of customers for each IBL assisted shop/stockist not known. Working assumption: 10 per shop

Annex G: Smallholder Survey Questionnaire (Passion fruit)

September 21 version

Interviewer number ☐☐*

FOR OFFICE USE ONLY

SERIAL No. _____(101-104)

RESEARCH INTERNATIONAL

Farmer's name_____

Address _____

Contact _____ _____ _____

Telephone Number _____ _____Interview Date _____

Interviewer's name _____ _____I.D.# ☐☐☐☐☐* (107-111)

Time Interview Began _____Ended _____ Interview length _____ (112,113)

I declare that this interview has been carried out strictly in Accordance with your specification and has been conducted within the MRS Code of Conduct with a person unknown to me.	Interviewers signature.	Checked by supervisor

Date begun participating in the project

D	D	M	M	Y	Y	Y	Y

(120/121) (122 /123) (124 – 127)

Project (tick box) 128/33		District (tick box) 134/35		Division (write down) (136/138)	Village (write down) (139/41)	Group/Shop (write down) (142/44)
FINTRAC	01	Uasin Gichu				
		Keiyo				
		Poror				
		Baringo				
		Bungoma				
		Kakamega				
		Busia				
		Maragua				
		Thika				
		Kirinyaga				
JUST		Embu				

JUICE						
		Meru				

(145/47) (150/59)

Person who showed you where to go _____ Tel_____

DESCRIBE HOW TO REACH THE FARM FROM THE NEAREST WELL-KNOWN TOWN / POINT, SO THAT A STRANGER CAN MAKE IT. INCLUDE NEAREST CHURCHES, SCHOOLS OR OTHER LANDMARKS.

(207/21)

Detailed sketch map of the location of the farm

(222/36)

IF NAME IS PROVIDED FIND THE PERSON WHOSE NAME YOU HAVE BEEN GIVEN

IF NAME NOT PROVIDED: SPEAK TO OWNER OF FARM OR SPOUSE

Good morning / greetings etc. We are conducting a survey on farm and farm produce in specific areas to add to our knowledge about farmers in Kenya. We are from an independent research organization, we do not get

involved ourselves in anything to do with farming or assisting farmers, only in understanding their operations and views. We would like to spend some time to find out information about this farm. All of it will be used to estimate the situation in farms like yours across Kenya, so it is important the information is accurate. The information will be combined with that of many other farms, without your name attached, so no one will see the information you will give us. This is completely confidential.

Q1a Which if any of the following crops are you currently growing on this farm? SHOW CARD / READ OUT

240/53

Maize	01
Oranges	02
Mangoes	03
Cashew nuts	04
Passion	05
Lemons	06
Avocado	07

IF PASSION NOT MENTIONED ASK

Q1b Did you grow any passion fruit on your farm in the past 2 seasons (year)?

255

Yes.....1 GO TO Q2
No .....2 CLOSE AND CHECK WITH SUPERVISOR

Q2 Who is mainly in charge of running the fruit part of this farm?

307/308

Respondent his / her self	1	CONTINUE
Spouse	2	FIND SPOUSE
Other WRITE IN RELATIONSHIP WITH OWNER / SPOUSE	3	FIND OTHER PERSON

YOU MUST SPEAK TO THE PROPRIETOR / OWNER OF THE FRUIT PART OF THE FARM. THAT PERSON SHOULD BE THE KEY PERSON IN CHARGE, AND ABLE TO SPEAK ABOUT ACTIVITIES OF THAT PART OF THE FARM. DO NOT INTERVIEW FARM LABOURERS, YOUNG BOYS OR GIRLS.

EVEN IF THE FARM IS JOINTLY RUN WITH MANAGER AND BOTH HAVE ENOUGH KNOWLEDGE, ONLY THE PROPRIETOR/ OWNER CAN BE INTERVIEWED.

IF PROPRIETOR/ OWNER IS NOT AVAILABLE AT TIME OF INTERVIEW, ATTEMPT TO TRACE HIM / HER THREE TIMES BEFORE SUBSTITUTION. IF INTERVIEWING HIM/HER ELSEWHERE (OFF-SITE) COMPLETE OBSERVATION SECTIONS NOW!
IF UNABLE COMPLETE FRONT PAGE, WRITE IN REASON FOR SUBSTITUTION BELOW AND RETURN BLANK QUESTIONNAIRE TO SUPERVISOR FOR SUBSTITUTION WITH A CLEAN ONE
REASON FOR SUBSTITUTION: 309/23

INTERVIEW ONLY FARMS GROWING PASSION VINES

Q3 How many passion vines do you have on your farm?

	325/26	TEST	CONTROL
1 – 9	1	CLOSE	CLOSE
10 – 19	2	CONTINUE	CHECK YOUR QUOTA TO SEE IF THIS FARMER FITS
20 – 29	3		
30 – 49	4		
50 – 99	5		
100 +	6		

Q4 Into which age-range do you fall? SHOW CARD

	331/32
18 – 19	1
20 – 24	2
25 – 29	3
30 – 34	4
35 – 39	5
40 – 44	6
45 – 49	7
50 – 54	8
55 – 59	9
60 +	10

IF REFUSED / DON'T KNOW, CODE BELOW AND ESTIMATE

	333
Refused so Estimated	1
Don't know	2

Estimate made: _____ 334/35

CONTROL CELL

Q5a How many years of education did you manage to complete?

None	01
Less than 1	02
1 – 2	03
3 – 4	04
5 – 6	05
7 – 8	06
9 – 10	07
11 – 12	08
13 – 14	09
15+	10

Q5b What was the highest level of education you reached?

None	1

Nursery	2
Incomplete primary	3
Completed primary	4
Did not completed secondary	5
Completed secondary	6
A levels	7
Higher education (diploma, or degree)	8
Other higher technical or training after completing secondary school / A-levels	9

Q6 Gender

Male.....1
Female.....2

ASK ALL

Q7 Which types of passion do you grow? CODE ALL GROWN IN FRUIT GRID BELOW

Q8 And how many mature vines of each type do you have – that is those that yielded fruit in the most recent season? RECORD NUMBER IN FRUIT GRID BELOW

Q9 How many vines are young and yet to yield? ? RECORD NUMBER IN FRUIT GRID BELOW

Q11 What is the average number of fruits per vine for each variety you grow? RECORD NUMBER IN FRUIT GRID BELOW

Q12 What was the price per piece the last time you sold? RECORD NUMBER IN FRUIT GRID BELOW

Q13 How do you measure the amount of passion produced and sold? RECORD IN FRUIT GRID USING THESE CODES SHOW CARD

By the piece (single fruit) ----------1
By the kilo----------2
By the bag----------3
Other WRITE IN
----------4

Q14 You mentioned you measure by the _____ MEASURE. About how many passion fruits are in that? RECORD IN FRUIT GRID BELOW

PASSION FRUIT GRID 1

	Grown Now **Q7**	Number yielding fruit **Q8**	Number young and have not yet yielded **Q9**	Av Number of passion per vine **Q11**	Price per piece the last time you sold **Q12**	Normal Unit of Measure **Q13**	Number of passion fruits in measure **Q14**
Yellow	20						
Purple	21						
Other WRITE IN	22						

Q15 During the last season did any of your passion vines suffer from damage from pests or disease?

Yes---------- 1 GO TO 16
No ---------- 2 GO TO 17

Q16 Approximately what percentage of your passion vines was destroyed through pests or disease?
(INT: Percentage of vines destroyed =Number of vines destroyed * 100 %)
Total number of vines

FOR EACH PASSION TYPE GROWN ASK

Q17 During which months do you harvest---------- variety? (INT: CIRCLE ALL MONTHS MENTIONED)

MONTH	PURPLE	YELLOW	OTHER
January	1	1	1
February	2	2	2
March	3	3	3
April	4	4	4
May	5	5	5

June	6	6	6
July	7	7	7
August	8	8	8
September	9	9	9
October	10	10	10
November	11	11	11
December	12	12	12
Other	13	13	13

INT: HELP THE FARMER GO THROUGH Q18 TO Q25 BEFORE GOING TO THE NEXT TYPE. REPEAT THIS PROCEDURE TILL ALL DETAILS OF ALL TYPES HARVESTED ARE RECORDED.

IF NO SKIP TO NEXT TYPE GROWN IN Q7

YOU WILL HAVE TO CONVERT THE UNITS THE FARMER IS TALKING ABOUT TO PIECES OF FRUIT

Q18 Can you tell me what was the number picked in….. ……..(last two consecutive harvest months)? CONVERT THE UNITS GIVEN BY THE FARMER TO PIECES OF FRUIT

Q19 What was the number sold in…. …(last two consecutive harvest months)? INTERVIEWER ADD UP THE TOTALS

Q20 What was the price per piece? (SEE GRID BELOW)

Q21 What was the total sales you got for…… TYPE GROWN in……(last 2 consecutive harvest months)? WRITE IN TOTAL IN KSHS.

Q22a Who was your main buyer? Was it …..READ OUT CODES AND CODE ANSWER IN GRID BELOW

Direct to exporter---------- 1
Broker selling to exporter ---------- 2
Broker selling in Kenya ---------- 3
Broker (Do not know who selling to)---------- 4
Local traders selling in Kenya (from nearby by towns) ---------- 5
Direct to consumer ---------- 6
Wholesale markets/ wholesaler ----------7
Shop / Supermarket ----------8
Fruit processor factory----------9
Another farmer ----------10
Other (Specify) ---------- 11
11

Q22b How much money in total did you sell your mangos for in the past season?

Q22c How much money in total did you sell your mangos for in the season before last?

Q23 Did you have a contract with the buyer for any of these passion fruits? That is where there is an order that you have to fill to a secured buyer.
CODE IN GRID USING THE CODES BELOW
Yes----------1GO TO Q 26
No ----------2 IF ALL TYPES HARVESTED HAVE BEEN COVERED, GO TO Q29 ELSE GO TO Q27

ASK TO THOSE WITH A CONTRACT
Q24 Was it a written or a verbal contract?
CODE IN GRID USING THE CODES BELOW
Written----------1
Spoken----------2

Q25 What proportion of the harvest was sold on contract? ----------

Last 2 consecutive month harvest (e.g. June – August)	TYPE GROWN (CIRLE)	Normal unit of measure	Number picked Q18	Number sold Q19	Price per piece Q20	Total sales got Q21
	Purple					
	Yellow					
	Other					

FOR GRID BELOW, REFER TO Q17 AND ASK OF THE MOST RECENT HARVEST ONLY

	Q22 Who sold to											Had contract ? Q23	Type of contract Q24		% sold on contract Q25
TYPE GROWN	Direct to exporter (I)	Broker Selling to exporter (ii)	Broker selling in Kenya (iii)	Broker Do not know who selling to (iv)	Local traders selling in Kenya (from nearby by towns) (v)	Direct to consumer (vi)	Wholesale markets (vii)	Shop/ Supermarket (viii)	Fruit processing factory (ix)	Another farmer(x)	Other (xi)		Written	Spoken	WRITE IN
Purple	1	2	3	4	5	6	7	8	9	10	11		1	2	
Yellow	1	2	3	4	5	6	7	8	9	10	11		1	2	
Other	1	2	3	4	5	6	7	8	9	10	11		1	2	
	1	2	3	4	5	6	7	8	9	10	11		1	2	

IF SOLD ANY PASSION FRUIT IN THE PAST 2 SEASONS ASK

Q26 Can you describe all the people or companies you sold to in the past 2 SEASONS?
WRITE IN NAME/S. GIVE CONTACT DETAILS IF POSSIBLE OF ONE OF THESE (THIS IS FOR FIELD CONFIRMATION ONLY DP NOT FOR CODING)

IF HAS SOLD ON CONTRACT IN THE PAST 2 SEASONS ASK

Q27a. You mentioned that you have sold some passion fruit as part of a contract with a buyer. In general, how would you rate the reliability of buyers of passion fruit that are dealt with around here? That is how reliable are they in fulfilling their side of the bargain?

Very reliable ---------- 1
Fairly reliable---------- 2
Somewhat unreliable ---------- 3
Very unreliable ---------- 4

Q27b. You have just said that buyers of passion fruit around here are..(answer given in Q27a.). Why do you say this?

IF HAS SOLD ANY PASSION FRUIT IN THE PAST 2 SEASONS ASK

Q28 Were any of the passion fruits you sold in the past 2 SEASONS sold as part of a group agreement with other farmers?

Yes ..... 1 GO TO 31
No..... 2 GO TO 32

IF YES

Q29 About what proportion of the passion fruit that you sold did you sell as part of a group agreement with other farmers in the past 12 months? CODE BELOW

	Past 12 months	Past 2 harvest seasons
All of them	1	1
Most of them	2	2
Some of them	3	3
None of them	4	4
Don't know	5	5
Rough estimate	6	6

LABOUR INPUTS SECTION – PAID LABOUR

Q30 Did you pay anyone to do any work on your passion vines in the past 2 HARVEST SEASONS (12 MONTHS)?

Yes 1
No 2

IF YES ASK

Q31 About how much did you spend on for the passion part of the farm in total in the last 2 HARVEST SEASONS? WRITE IN AMOUNT WITH LEADING ZEROS

Q32. What is the average wage per day? INTERVIEWER WRITE IN. IF LABOUR IS PAID PER PIECE (VINE) INTERVIEWER ASK AND CALCULATE THE TOTAL NUMBER OF PIECES THAT CAN BE DONE IN A DAY.

Q33a. USE MAIN LABOUR ACTIVITY (E.G. SPRAYING) Last time you sprayed how many paid MEN/WOMEN worked on your farm in total in the past 2 HARVEST SEASONS (12 months)?

How many WOMEN worked and for how many days? WRITE ANSWER

WOMEN:_____ Days Worked:_____

Q33b. How many MEN worked and for how many days? WRITE ANSWER

MEN:_____ Days Worked:_____

INTERVIEWER USE ITERATIVE APPROACH TO CALCULATE THE TOTAL AMOUNT OF MAIN LABOUR ACTIVITY PUT INTO THE PASSION VINES OVER THE LAST 12 MONTHS.

Q34. On average, for how many days do the labourers work in a month?

Total man-days in a month:

Q35 Do you have any irrigation system on the fruit tree part of the farm in current working order and used?

Yes ..... 1 GO TO 39
No ..... 2 GO TO 40

IF YES ASK

Q36 What is the type? CODE BELOW

Drip 1
Sprinkler 2
Hand watering 3
Other (Specify)
..... 4

INPUTS

Q37 In the last 12 months, did you plant any of the passion vines you have on your farm?

Yes ..... 1 GO TO 41
No ..... 2 GO TO 42

IF YES

Q38 How much did you spend in total on the seedlings / plants? (This amount includes all moneys spent on buying, planting, fertilizing and transport)

Q39 How do you grow your seedlings? (Ask only for farmers who buy seeds and then grow their own seedlings)

Shade nurseries 1
Other(Specify)
..... 2

Q40 Did you buy any fertilizer or treatment for pests and diseases for use on your passion vines in the last 2 harvest seasons?

CODE IN GRID BELOW

Yes ..... 1 GO TO 44
No ..... 2 GO TO 45

Q41 What was the total amount spent in the past 2 harvest seasons?

	Used	Amount spent
Treatment for pests and diseases	1	
Fertilizer	2	

Q42 Regardless of whether or not you rent, what is the normal price to rent an acre of land in this area?

Don't know 1

Q43 IF DON'T KNOW. What does it cost, roughly, to buy an acre of land in this area?

Q44 Apart from labour, pesticides and fertilizer, did you have to pay for anything else to run the passion part of your farm in the last 2 seasons?

Yes ..... 1 GO TO 48

No..... 2GO TO 50

IF YES

Q45 What did you pay for? WRITE IN

Q46 What did it cost?

Q47 IF POLES MENTIONED ABOVE ASK. How many do you own?

Q48 IF WIRE MENTIONED ABOVE ASK. How many do you own?

Q49 IF STOREROOM MENTIONED ABOVE ASK. About how many feet squared is it?

Q50 When did you start growing grafted / improved passion fruits? WRITE IN MONTH AND YEAR (MM/YYYY)

Q51 What prompted you to start growing grafted passion fruit….? WRITE IN

Q52 In the past 12 months / 2 years has anything changed about the techniques or procedures you use to grow, organize, or market your passion fruit?

Yes ..... 1 GO TO 57
No..... 2GO TO 59

IF YES

Q53 What new things have you been doing? OPEN ENDED

Q54 Who prompted you to make those changes? OPEN ENDED

Q55. Did you get any <u>useful</u> new technical advice, information or training or other help regarding passion fruit in the past 2 years from any source?

Yes ..... 1 GO TO Q60a
No..... 2 GO TO Q60a

Q56 What about more recently- in the past 12 months?

Yes ..... 1 GO TO 60b
No..... 2 GO TO Q65

Q57 Thinking about the most recent advice, information or training that you received, how useful was this technical advice, information or training

CODE
Not at all useful.....1
Somehow useful.....2
Neither useful nor not useful 3
Useful 4
Very useful.....5

Q58 Where or from whom did you get this advice, information or training ?
CODE IN THE GRID BELOW

FOR SOURCES NOT MENTIONED IN Q68, ASK

Q59 Did you get any useful advice, information or training from any of the following? CODE IN GRID BELOW

Q60 Did you pay anything for any of this advice? CODE IN GRID BELOW
IF PAID ANYTHING, WRITE AMOUNT

	SPONTENOUS Q61	PROMPTED Q62	PAID Q63
Ministry of Agriculture/KARI extension officers	1		
Other Extension officers	2		
Nurseries	3		
Agro-chemical company/s	4		
People who come to spray or do other things on the farm	5		
Producer groups (a group of farmers of which you are a member)*	6		
Buyers of the fruit	7		
Shops supplying supplies. Which specific shop? WRITE IN	8		
Local leaders	9		
Mobile sms's	10		
Trading centers WRITE IN NAME OF CENTER	11		
Seminars and meetings ASK WHO ORGANIZED*	12		
Neighbours, family and friends	13		
Radio	14		
Newspapers, magazines	15		
Posters	16		
TV	17		
HDC Project*	18		
SITE project*	19		
KADI project*	20		
Kenya BDS*	21		
East African Growers*	22		
IBL Dukas	23		
Other WRITE IN	24		

Who exactly helped you? WRITE IN
(NOT FOR CODING BUT FOR CROSS CHECKING WITH PROJECT)

IF AN ORGANIZATION/S HELPED (Those marked with asterix*)ASK
Q61 How exactly were you helped? OPEN ENDED WRITE IN
PROBE IN DEPTH

PRODUCER GROUP MEMBERSHIP

Q62 Are you a member of a group or association of farmers?

Yes ..... 1 GO TO Q65
No..... 2 GO TO Q75

Q63 What is the name of the group? WRITE IN FOR FIELD ONLY NOT FOR CODING IN DP

_____

Q64 Is there an advantage to being a member of the group?

Yes ..... 1 GO TO 68
No..... 2 GO TO 69

Q65 What, if anything, are the advantages of being a member of this group? OPEN ENDED

Q66. Is there anything that you do with the producer group to improve your passion fruit business?

Yes ..... 1 GOTO 70
No..... 2 GO TO 71

IF YES

Q67 What do you do with the producer group to improve your passion fruit business? WRITE IN

Q68 FOR RESPONSES NOT MENTIONED IN Q70, ASK: Do you……?

Share information / get access to information which you wouldn't otherwise have	1
Buy inputs in bulk/cheaper price	2
Get access to better prices	3
Are you able to fulfil larger orders by pooling resources	4
Have access to contract growing	5
Other	6

Q69 Did you attend meetings with the producer group in the past 6 months?
Yes ----------1 GO TO Q73
No----------2 GO TO Q74

Q70 IF YES: How many times have you met with the producer group within the last 6 months?
WRITE DOWN:_____

Q71 How useful to you personally is membership of the producer group?

Very Useful -------- 1
Fairly Useful -------- 2
Not at all useful ----- 3

HOUSEHOLD QUESTIONS

I now want to ask you some questions about the household as a whole

Q72 In this household, which of the following activities do you engage in? READ LIST .
ENGAGED----------1
NOT ENGAGED ----------LEAVE BLANK

Q73 Which activities bring income to the household?
CIRCLE CODE FOR THOSE THAT BRING IN INCOME
FOR THOSE THAT DO NOT GIVE INCOME LEAVE BLANK

FOR THE ACTIVITIES NOT MENTIONED ASK

Q74. What is the order of importance of each of these activities in the household's total income during the past 12 months? Which one is the highest source of income? WRITE 1

Which is the second highest source of income? WRITE 2
Which one is the third highest source of income? WRITE 3
CONTINUE THIS WAY TILL ALL ACTIVITIES ENGAGED IN HAVE BEEN RANKED.

IF AN ACTIVITIY COULD NOT BE RANKED WRITE 99

Economic Activity	Engage in	Give income	HOW IMPORTANT IN HOUSEHOLD INCOME
			ORDER
Production and sales of cereals and tubers		1	
Production and sales of vegetables		2	
Production and sales of mangos		3	
Production and sales of other fruits		4	
Livestock production and sales		5	
Farm Kibarua		6	
Non-farm kibarua		7	
Salaried labour		8	
Business activities		9	
Remittance (receiving money from others)		10	
Other (Specify)		11	

Q75 Could you tell me the total number of people who are usually resident in this household including babies? HOUSEHOLD INCLUDES ALL THOSE WHO OFTEN SHARE FOOD

Q76 How many engaged in any business or informal labour activities during the past 12 months?

Q77 How many engaged in any salaried employment during the past 12 months?

CONSUMPTION OF ITEMS GROWN AT HOME

Q78 In the past seven days, which of the following has been eaten in this household, that is since SAY DAY last week? That is things that were grown (or kept) NOT purchased. CODE IN GRID BELOW

Q79 What should be the total cost? WRITE IN GRID BELOW AND ENSURE YOU WRITE IN THE UNIT OF MEASURE e.g. KILOGRAM, TRAY, etc

		Unit of measure	Number of units consumed **Q81**	What should be the cost **Q82**
Meat	1			
Chicken	2			
Eggs	3			

Milk	4			
Maize or other flour	5			
Rice	6			
Potatoes	7			
Red Beans	8			
Peas	9			
Green Grams	10			
Groundnuts	11			
Coconuts	12			
Bananas	13			
Pineapple	14			
Mango	15			
Avocado	16			
Passion Fruit	17			
Oranges, tangerines	18			
Paw Paws	19			
Sweet potatoes	20			
Cassava	21			
Arrow roots	22			
Yams	23			
Cabbage and lettuce	24			
Sukuma Wiki	25			
Tomatoes	26			
Onions	27			
Carrots	28			
French beans	29			

CONSUMPTION OF ITEMS PURCHASED

Q80 Thinking about the last 12 months, how much has this household spent on education? Please include everything relating to education, tuition and registration, uniforms and sports attire, books, stationery, transport, harambees and so on.

WRITE IN BOX. USE LEADING ZEROS.

Q81 Thinking about the last 4 weeks, what in total did this household <u>spend</u> on any other items? Include all items that have been bought such as vegetables, meat and packaged food, groceries, and items paid for such as bills, rent, cooking fuel, transport, communication, paying out money to others, and anything else.

WRITE IN BOX USE LEADING ZEROS

IF REFUSES, SHOW CARD WITH RANGES AND CODE BELOW

Less than Kshs 100	1

Kshs 101 – 500	2
Kshs 501 – 1000	3
Kshs 1001 - 1500	4
Kshs 1501 - 2000	5
Kshs 2001 - 2500	6
Kshs 2501 – 3000	7
Kshs 3001 – 3500	8
Kshs 3501 – 4000	9
Kshs 4001 – 5000	10
Kshs 5001 - 10000	11
Kshs 10,001 – 15,000	12
Kshs 15,001 – 20,000	13
Kshs 20,000 – 50,000	14
Kshs 50,000 +	15

Q82 Are you the head of the household? (By head of household I mean are you the main income earner in the household)

Yes ..... 1 GO TO 87
No..... 2 GO TO 86

IF NO ASK:

Q83 What is the gender of the head of the household?

Male ---------- 1
Female---------- 2

Q84a. Do you rent this land , a member of your family rents it, or do you own the land?

I rent land ----------1
Family member rents ----------2
Owns land ----------3

Q84 What is the size of your land-holding in acres – include all the different lands you have, even if not here. You can show me on this card SHOW CARD/READ OUT RANGES

0 – ½	1
¾ - 1	2
1 ¼ - 3	3
3 ¼ - 5	4
5 ¼ - 10	5
10 ¼ - 20	6
20 ¼ - 30	7
30 ¼ - 50	8
50 ¼ - 100	9
100 ¼ - 500	10
500 ¼ - 1000	11
1000 +	12
Don't know	13

IF DON'T KNOW CODE 13, AND ESTIMATE.

Estimate made : _____

ASSET SCORE

Q85 RECORD THE WALL MATERIAL BY OBSERVATION

Principle wall material?	Circle code
Mud or cow dung	1
Stone	2
Bricks/cement	3
Wood	4
Grass/sticks/makuti	5
Iron sheets	6
Other (Specify)	7

Q86 RECORD THE MAIN ROOFING MATERIAL (IF MORE THAN ONE DWELLING IN BOMA, TAKE THE BEST ONE)

Principle roofing material?	Circle code
Mud or cow dung	1
Stone	2
Bricks/cement	3
Wood	4
Grass/sticks/makuti	5
Iron sheets	6
Tiles	7
Other (Specify)	

Q87 Description of Household

Description	Record number
Number of rooms in boma occupied by members of the household	
Number of members divided by number of rooms	
Any two story house present?	1
A domestic worker not related to household head	2
Number of blankets per bed	
Number of chairs with backs	
Number of tables	
Sofa set (2 or 3 piece)	3
House has built in kitchen	4

Q88 Source of drinking water

Source	Circle code
Piped water in boma	1
Piped water outside boma	2
Private well in boma	3
Water Tank in boma / on farm	4
River, pond, canal etc	5
Public well	6
Other (Specify)	7

Q89 Agricultural assets

	Circle code
Metal ladder	1
Wheel barrow	2
Hand Cart	3
Animal cart	4
Irrigation equipment (pipes)	5
Tractor	6
Plough for tractor	7
Plough for oxen	8
Bore hole or dam on farm/residence	9
Water pump	10
Donkey / camel	11
Water trough (metal)	12
Other (Specify)	13
Ladder	14
Knapsack Sprayer	15
Motorised sprayer or share of motorised sprayer	16
Poles	17
A pruning knife or saw	18
Wire	19
Drip irrigation system (water seeps from pipes across the ground)	20
Sprinkler irrigation system	21
Water tank for the farm or house/farm	22
Picking crates	23
Storeroom SPECALLY FOR FRUITS	24

Q90 Cooking utensils

	Circle code
Number of metal pots/sufurias/kettles	
Three stones	1
Jiko – charcoal	2
Paraffin Stove	3
Gas/electric stove – rings	4
Gas/electric oven	5
Number of metal knives for chopping	6
Number of ceramic serving dishes	7
Glass cups	8
Plastic cups	9
Number of soda or beer bottles	10
Free standing deep freezer	11

Q91 What lighting or power system do you use in your household?

	Circle code
Candle	1
Paraffin lamp	2
Pressure lamp	3
Generator	4

Solar	5
Matches	6
Battery system / car battery	7
Electricity	8

Q92 Do you have any of the following in your household?

	Circle code
TV – black and white	1
TV – colour	2
Have you watched TV in the last 7 days?	3
Have you read a newspaper in the last 7 days?	4
Radio	3
Radio cassette player	6
Video recorder	7
Cell phone/Mobile phone with working line	8
Fixed telephone line or outstanding application	9
Still camera	10
Cassette player	11
CD player	12
Hi-fi music center	13
Video camera	14
Sewing machine	15
Vacuum cleaner	16
Electric iron	17
Have you had access to internet in the past 4 weeks?	18
Other (Specify)	19

Q93 Which, if any, of the following do you have?

	Circle code
Car / pick-up	1
Motorcycle	2
Bicycle	3
Truck / lorry	4
Do you have more than one motor vehicle?	5

Q94 Record the following by observation

Type of toilet facility available	Circle code
Flush latrine outside	1
Flush latrine inside the residence	2
Pit latrine	3
None	4

Q95 Check if any of the following is present in the household. NOTE YOU MUST SEE THE PACKAGING WITH AT LEAST SOME PRODUCT IN IT

Pantry check	Circle code
Hard soap for washing	1
Body/face soap	2
Shoe Polish in house	3
Cooking Oil	4

Matches	5
Squash	6
Maize flour (purchased not posho)	7
Royco or similar type of food flavouring	8
Drinking chocolate / Cocoa / Bournvita	9
Sugar	10
Salt	11
Tea leaves / tea bags	12
Other (Specify)	13

Q96 What is the main floor material of the best house on the boma?

	Circle code
Packed mud or cow dung	1
Stone	2
Bricks	3
Wood / timber	4
Cement	5
Tiles or linoleum (plastic floor covering)	6
Earth	7
Other (Specify)	8

CLOSE INTERVIEW AND THANK RESPONDENT
ENSURE YOU HAVE RECORDED ENOUGH INFORMATION IN THE QUESTIONNAIRE SO THAT THIS RESPONDENT CAN BE TRACED IN 2 YEARS TIME

SUPERVISOR ONLY *(144)*

Test Cell ……..	1
Control Cell ……	2
FINTRAC ……..	3
BDS……	4

Annex H: Analysis plan for baseline survey

SEPTEMBER 27, 2004 version

KENYA TREE FRUITS IMPACT ASSESSMENT
ANALYSIS PLAN FOR BASELINE SURVEY

Introduction

As its name suggests, the baseline survey is intended to collect information for the participant and control samples that can be compared with data to be collected two years later from the same respondents to determine the impact of the Kenya BDS and Horticulture Development Center projects. This note outlines a plan for tabulating and analyzing the data to be collected. Data analysis at the baseline stage is simple, consisting purely of simple frequency distributions and cross-tabulations. More sophisticated data manipulation to plot relationships among variables and determine their statistical significance will follow the second round of data collection.

Drawing on the research plan (in particular, the causal model shown in Figure 1), the baseline survey should measure potential impact variables for samples of participants and controls in the covered interventions:

- Sales, productivity, and trade in mango, passion fruit, and avocado.
- Household incomes for those engaged in mango, passion fruit, and avocado production.
- Paid employment.

The baseline will provide information about the current levels of these variables in sampled enterprise and households and afford an opportunity to analyze some of their determinants (other than the impact of program participation, which can only be determined after the second survey round).

RI's responsibility in regard to data analysis is three-fold. First, it will provide a number of tables, including but not necessarily limited to, those specified in this memo. Second, it will provide the database to AFE in easily accessible form (Excel and SPSS), permitting additional tabulations and calculations to be performed by AFE if necessary. Third, RI will retain the database from the baseline survey for further analytical use following the second-round survey.

The basic tables to be assembled from the data collected in the baseline survey are grouped into three sections: (1) descriptive information on the respondents; (2) information on the smallholder MSEs included in the sample; and (3) information on the households associated with the sampled smallholder MSEs. The remainder of this note describes the tabulations to be performed in each of these categories. Some of the

information displayed in the tables described below is binary (e.g., yes/no, male/female), while other information is grouped data derived from frequency distributions. Grouped data displayed in tables should be backed up by raw counts that show the full (ungrouped) frequency distribution.

After the tables described below are examined, additional cross-tabulations may be specified. For example, we may want to determine the relationship between the educational attainment of the entrepreneur or the household's asset score on such activities as participation in producer groups and use of purchased inputs and business advice. The database should be organized to make such inquiries easy to perform.

Basic Descriptive Information on Respondents

NOTE: The purpose of this section is to provide brief descriptive information on the survey sample and its respondents.

Table B-1. Distribution of Sample by Interventions. Shows the numbers of participant and control group respondents surveyed for each intervention,[20] as well as the total number surveyed from each population.

Tables B-2a-1 to 8.[21] Demographic Profile of Respondents. Shows several types of personal information for respondents (individuals who manage fruit farms):

- Age and sex. Group men and women as young (up to 34), middle aged (35-54), or old (55-).
- Relationship to head of beneficiary household: self; spouse; other.
- Educational attainment (separately for male and female respondents). Never attended school; primary school only; some secondary school; some post-secondary education.
- Religion: Christian; Muslim; other.

Prepare one table for each intervention plus one for total. Note: Questions need to be added to provide this information on respondents (fruit farm operators/beneficiaries). As noted below, we do not need the information for heads of household, but rather for those who operate the smallholder MSEs.

Information on Sampled Smallholder MSEs

NOTE: The purpose of this section is to describe the smallholder MSEs covered by the survey. Numerous characteristics of the enterprise need to be measured: the land area devoted to tree fruit (or number of trees), the annual level of fruit production, cash sales,

[20] Each intervention means each of the six Kenya BDS interventions included in the study, as well as the Fintrac passion fruit activities, which are counted as one intervention.
[21] A separate table should be prepared for each intervention, plus a summary table for the entire survey.

production and sales of improved varieties, marketing channels used, hired labor used, production inputs, sources of business information and services, and producer group membership.

Tables E-1a-1 to 6. Smallholder MSEs by Number of Trees (Avocado and Mango). Prepare a table for each avocado and mango intervention. Use the size groups in the draft questionnaire (Q3):

- Avocado: 1-4 trees; 5-9; 10-19; 20-29; 30-49; 50-99; 100+.
- Mango: 1-9 trees; 10-19; 20-29; 30-49; 50-99; 100+.

Tables E-2a-1 and 2. Smallholder MSEs by Area of Passion Fruit (Passion Fruit Interventions Only). Prepare separate tables the Kenya BDS and Fintrac passion fruit interventions. Use the size groups in the draft questionnaire: up to ¼ acre; over ¼ to ½; over ½ to 1; over 1-3; over 3-5; over 5-10; over10-20; over 20-30; over 30-50; over 50.

Tables E-3a-1 to 8. Smallholder MSEs by Total Farm Area. Prepare a table for each intervention. Use the size groups in the draft questionnaire: up to 1/2 acre; over ½-1; over 1-3; over 3-5; over 5-10; over 10-20; over 20-30; over 30-50; over 50-100; over 100-500; over 500-1,000; over 1,000.

Tables E-4a-1 to 8. Interest in Growing Passion Fruit. Prepare a table for each intervention. Classify answers as: yes; probably – if can grow; no.

Tables E-5a-1 to 8. Quantity of Fruit Produced in Past Year (Last Harvest or Harvests). Prepare a table for each intervention, using appropriate physical measures (number, weight, volume; multiple measures when available) for the targeted fruit crop (e.g., mangos for mango interventions). Group the responses to give a reasonable idea of the range of variation.

Tables E-6a-1 to 8. Productivity: Quantity of Fruit Produced per Tree (Avocado and Mango). Derived from Tables E-5 and E-1. Group the responses to give a reasonable idea of the range of variation.

Tables E-7a and b. Productivity: Quantity of Passion Fruit Produced per Acre Planted. Derived from Tables E-5 and E-2. Group the responses to give a reasonable idea of the range of variation.

Tables E-8a-1 to 8. Sales of Targeted Tree Fruit in Past Year (Last Harvest or Harvests). For each intervention, show: (1) the percentage of the targeted tree fruit crop that is sold (e.g., mangos for a mango intervention; ignore sales of any other tree fruits); (2) the amount in shillings realized from sales; (3) sales by the customer types listed in the questionnaire (direct to exporter/lead firm; direct to processor; broker; local trader; fresh

fruit retailer; direct to customer; another farmer); (4) terms of sale (spot or contract); (5) point of sale (on the tree; at the farm gate; transported by farmer to another point of sale).

Tables E-9a-1 to 8. Sales of Improved Varieties of Tree Fruit in Past Year. Replicate Tables E-8a-1 to 8 for improved varieties only. For each fruit, we will need a list of improved varieties.

Tables E-10a-1-8. Farmers' Ratings of Reliability of Contractors. Based on answers to Q34, for farmers who sold some of their crop on contract within each intervention, tabulate numbers who rate contractors as very reliable, fairly reliable, somewhat unreliable, very unreliable, don't know/can't say.

Tables E-11a-1 to 8. Sales of Improved Varieties as Part of a Group Agreement with Other Farmers in Past Year. For each intervention, tabulate yes or no and, if yes, the proportion of total sales made in this way (see Q36 for categories).

Tables E-12a-1 to 8. Use of Hired Labor in Tree Fruit Cultivation in Past Year. Tabulate yes or no and, if yes, total person-days and the total amount spent on labor. Show breakdown of person-days and amount spent on men and women workers.

Tables E-13a-1 to 8. Availability of Irrigation for Tree Fruit Cultivation. Tabulate responses to Q43 as yes/no. Tabulate yes answers by type of irrigation: drip; sprinkler; hand watering; other.

Tables E-14a-1 to 8. Fruit Tree/Vine Planting in Past Year. Tabulate responses to Q45 (yes/no).

Tables E-15a-1 to 8. Fertilizer Use. Drawing on answers to Q48 and Q49, show distribution of expenditures on fertilizer in past year (including no use).

Tables E-16a-1 to 8. Use of Spray for Pests, Insects, and Fungus. Drawing on answers to Q48 and Q49, show distribution of expenditures on sprays in past year (including no use). Expand question to include treatment of passion fruit (and other crops?) for fungus.

Tables E-17a-1 to 8. Equipment Used in Tree Fruit Cultivation. Simple tabulation of responses to Q57: yes/no for ladder, knapsack sprayer, motorized sprayer or share thereof, poles, pruning knife or saw, wire, drip irrigation system, sprinkler irrigation system, water pump, water tank, picking crates, store room.

Tables E-18a-1 to 8. Number of Poles, Length of Wire, and Number of Crates Used in Fruit Cultivation. Tabulate responses to Q58, Q59, and Q60.

Tables E-19a-1 to 8. Year Farmer Started to Grow Targeted Tree Fruit. Array responses to Q61.

Tables E-20a-1 to 8. Changes in Tree Fruit Cultivation Methods in Past Year. Yes/no. Yes answers on Q63 to be followed up by examining questionnaire answers to Q64 and Q65 to list/tabulate the nature of changes made and reasons for making them.

Tables E-21a-1 to 8. Sources of Useful Technical Advice, Information, or Training Obtained in Past Year. Based on Q66 and Q68, list all sources (as many as apply): none; Ministry of Agriculture/KARI; other extension officers; nurseries; agro-chemical companies; people Tables E-23a who come to spray or do other things on the farm; producers groups; buyers; shops supplying inputs; local leaders; etc. (see list in Q68).

Tables E-22a-1 to 8. Membership in Producer Group. Q71 (yes/no).

Tables E-23a-1 to 8. Participation in Producer Group. Add question(s) per comment at bottom of p. 20 of draft questionnaire. For members of producer groups, tabulate number of meetings attended in past year (or some other measure of participation).

Tables E-24a-1 to 8. Benefits of Producer Group Membership. For those who answered yes to Q71, tabulate yes/no answers to Q73. For those who answer yes to Q73, examine questionnaire answers to Q74 to list/tabulate the advantages mentioned.

Tables E-25a-1 to 8. Activities with the Producer Group that Improve the Tree Fruit Business. For those who answered yes to Q75, examine answers to Q76 and Q77 to list/tabulate the activities involved. Use categories in Q77 to classify activities.

Information on Households of Sampled Smallholder MSEs

NOTE: The purpose of this section is to tabulate information on the households associated with sampled smallholder MSEs to determine their sources of income, asset score, and consumption level. The asset score will be used to proxy the wealth level of the household at the start of the projects, while consumption will serve as a proxy for income, which will not be measured directly.

Tables H-1a-1 to 8. Household Size and Economic Activity. Tabulate for each intervention (participant and control groups) and separately for male and female-headed households. Show distribution of households by number of total members (Q81), number of members who engaged in business or informal labor in past year (Q82), and

number who had salaried employment Q83). Apropos the discussion at the bottom of p. 21 and top of p. 22, I think it is sufficient to add up these totals (i.e., it is not necessary to work it through one household member at a time). The number of economically active household members is the total of those reported on Q82 and Q83. However, to get accurate information it may be necessary, as an interviewing technique, first to list household members by name and then to establish whether each one is economically active.

Tables H-2a-1 to 8. Household Income Sources. For each intervention, show distribution of income source rankings – that is, for each source (numbered 1-10), show how many households ranked it first, how many second, etc., as well as the number that did not receive income from that source. Note: Avocado and passion fruit should be listed as specific income sources and not lumped under "other fruits" as in the current draft questionnaire.

Tables H-3a-1 to 8. Household Consumption Expenditure per Capita. Calculate total household consumption by adding totals from Q84, Q85, and Q86. If respondent answers Q86 with a range, use the mid-point of the range as the estimate. Then divide by number of household members (Q81) to obtain consumption expenditure per capita. Show distribution by appropriate size groups. Note: In my opinion, this simple per capita measure will suffice; the proposed correct for the lower consumption needs of children (note on p. 22) is probably more trouble than it is worth.

Note: Apropos Q87, Q88, and Q89, we do not need educational attainment for the head of household, but we do need it for the tree fruit operator (see B-2 above). Please rephrase the question. Highest level of education attained is probably more significant than the number of years in school, so the latter can be dropped.

Tables H-4a-1 to 8. Household Asset Score. RI to calculate an asset score for each household, based on information given in Q90 through Q99. Table will show distribution of households by asset score for participant and control samples in each intervention area.